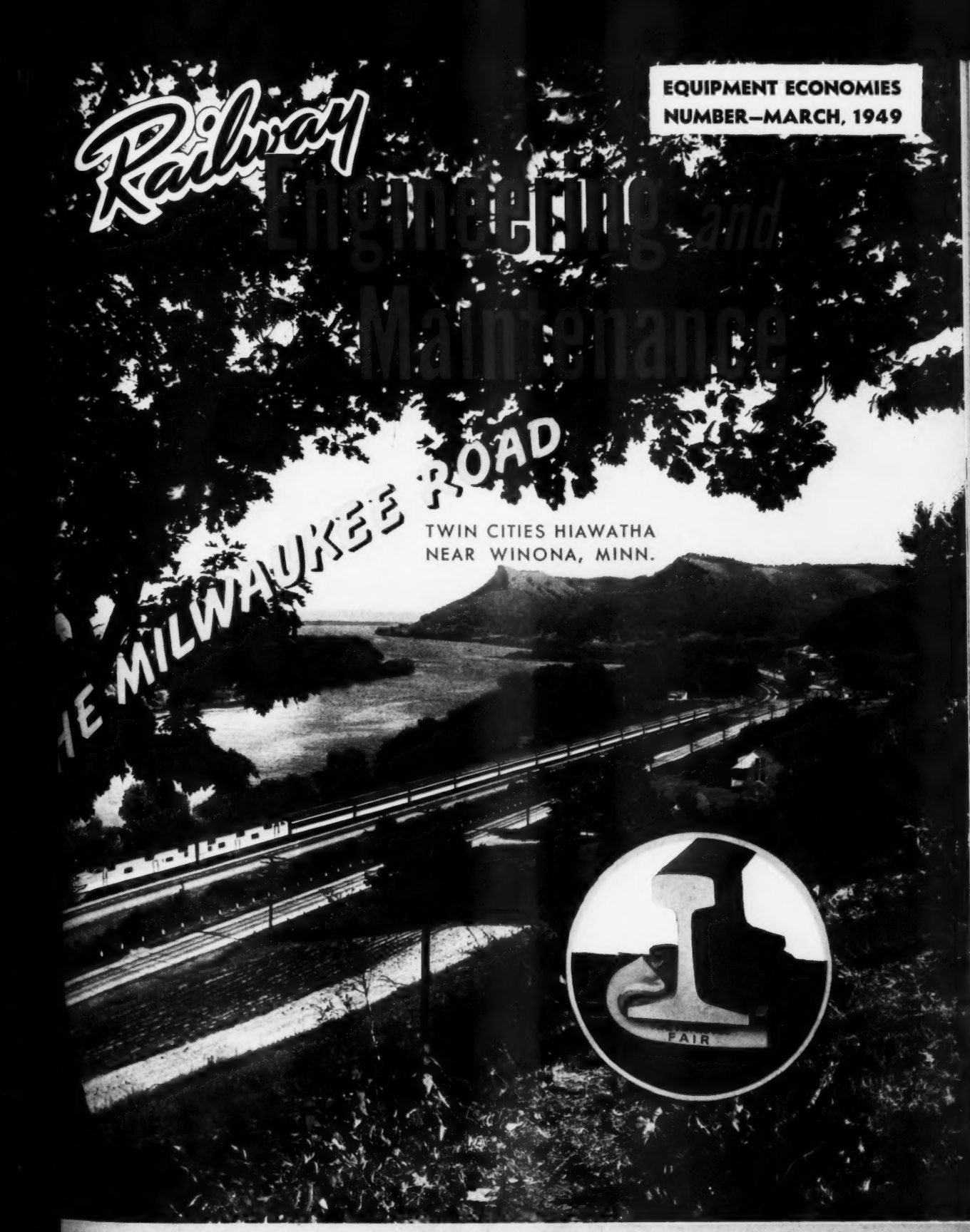
Railway Engineering and Maintenance

EQUIPMENT ECONOMIES NUMBER—MARCH, 1949



E MILWAUKEE ROAD is known for its Luxurious Modern Trains and well maintained
k in which THE IMPROVED FAIR ANCHOR shares because of its Effective Performance

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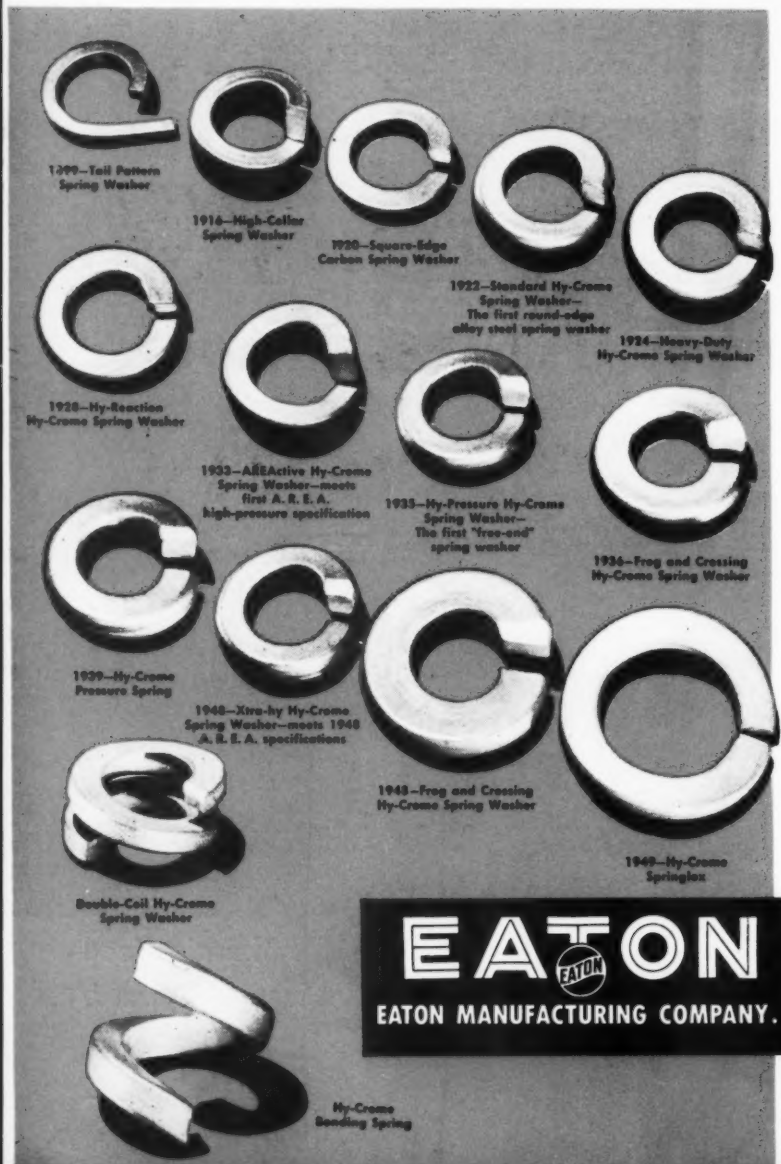
Congratulations

A. R. E. A.

GOLDEN ANNIVERSARY
1899-1949


1899—Tail Pattern Spring Washer
1916—High-Collar Spring Washer
1920—Square-Edge Carbon Spring Washer
1922—Standard Hy-Crome Spring Washer—The first round-edge alloy steel spring washer
1924—Heavy-Duty Hy-Crome Spring Washer
1928—Hy-Reaction Hy-Crome Spring Washer
1933—AREActive Hy-Crome Spring Washer—meets first A. R. E. A. high-pressure specification
1935—Hy-Pressure Hy-Crome Spring Washer—The first "free-end" spring washer
1936—Frog and Crossing Hy-Crome Spring Washer
1939—Hy-Crome Pressure Spring
1948—Xtra-hy Hy-Crome Spring Washer—meets 1948 A. R. E. A. specifications
1948—Frog and Crossing Hy-Crome Spring Washer
1949—Hy-Crome Springlox
Double-Coil Hy-Crome Spring Washer
Hy-Crome Bending Spring

When the A. R. E. A. was a youngster of thirteen years, Reliance started working with maintenance engineers to produce spring washers which would improve rail joint conditions, provide smoother riding track and reduce maintenance costs. This co-operation resulted in development of the first round-edge alloy-steel spring washer—*Standard* Hy-Crome.

Since that time, the Reliance Hy-Crome Railroad Spring Washer family has grown extensively and now includes spring washers for tie plates, motive power, rolling stock and track appliances as well as joint and track applications. Through the years Eaton-Reliance's efforts have been directed unceasingly toward progress in railroad track fastening techniques and today's railroad spring washers are scientifically designed and precision fabricated to meet the more exacting requirements of increased speeds and heavier axle loads of modern motive power and rolling stock.

We congratulate the A. R. E. A. on its Golden Anniversary and pledge continued co-operation in producing quality spring washers to keep track bolts *tighter longer.*

Pick up your historical booklet of Railroad Track Washers at Reliance Booths 82 and 83, N. R. A. Exhibit, Coliseum, Chicago, March 14-17—or write for a copy.

Reliance **spring washers**

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EATON MANUFACTURING COMPANY...RELIANCE DIVISION, MASSILLON, OHIO

Sales Offices: New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Montreal

OK TODAY...because we looked ahead

These Bethlehem bolted crossings were not installed yesterday, or the day before. They were put in service a number of years ago; yet they are doing the same fine job *now* as when they were new . . . easing main-line traffic along and asking no concessions, in spite of higher speeds and heavier loads.

There are hundreds of Bethlehem heat-treated, bolted crossings throughout the country, many of which have been in heavy-duty service since the '30's. One reason for their durability is that we look to the future when building a crossing. We look ahead to greater traffic volume, heavier impacts, increased speeds—and build accordingly. Hence, during their lifetime, Bethlehem crossings have ample strength for whatever comes their way.

All component parts of a Bethlehem bolted crossing are of forged or rolled steel. After machining, cutting, and assembly, the complete fabricated unit is carefully heat-treated under close pyrometer control. Finally the unit is dismantled, sand-blasted to remove scale, and reassembled with high-tensile alloy bolts, specially treated to resist stretching. The finished crossing is unusually resistant to wear, batter, spalling, and chipping.

Ask for full details. Whenever you say the word, we'll be glad to work with you on two- or three-rail jobs to your own standards or A.R.E.A. designs.

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Published monthly by Simmons-Boardman Publishing Corporation, 105 W. Adams St., Chicago 3, Ill. Subscription price: United States and Possessions, and Canada, $2.00 for one year; $3.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Mount Morris, Ill., post office. Address communications to 105 W. Adams St., Chicago 3, Ill.

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• Cleaner track
• Lower maintenance costs

Get all three benefits by using ballast coated with Texaco Asphalt

COAT your stone ballast with *Texaco Asphalt* — particularly ballast for station and other hard-to-maintain track — and you'll immediately reduce those serious drainage and fouling problems that make for excessively high maintenance costs.

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A ballast coating of *Texaco Asphalt* is long lasting, easy to apply, and its low cost will be more than repaid by your savings in maintenance. *Texaco Asphalt's* superior qualities — which make it ideal for railroad use — have been proved by more than 40 years of service on America's roofs, streets, and highways.

Find out in detail how *Texaco Asphalt* can reduce your track maintenance costs. Call the nearest Railway Sales Division office listed below, or write:

The Texas Company, *Railway Sales Division,* 135 East 42nd Street, New York 17, N. Y.

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TEXACO Asphalt for Coating Ballast

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with greater safety on the LINE!

JERKY OPERATION, balky clutches, slow acting controls, not only delay a job but they are dangerous in railroad operation.

Nicety of control and ease of operation is provided on the Northwest by the "Feather-Touch" Clutch Control. The "Feather-Touch" Clutch Control is free from complications — no pumps, no tubing, no refills, and it is unaffected by weather and temperature. Your Northwest will never be shut down because of control failure.

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Combine these with the smoothness of travel that makes it possible to load your Northwest under its own power and travel from car to car with other Northwest advantages. These are features that make your Northwest the equipment for the *Key Spots* at the heart of your railway jobs where safety is important. Plan now to have a Northwest. Let us give you more details and tell you how.

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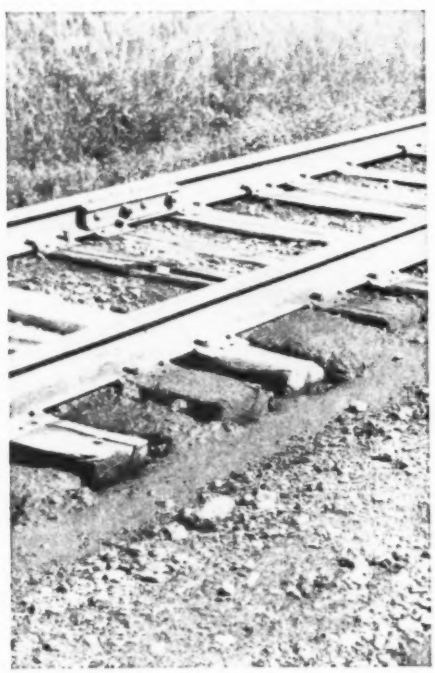
NORTHWEST

THE ALL PURPOSE RAILROAD MACHINE
SHOVEL • CRANE • DRAGLINE • PULLSHOVEL

You can't sue a subgrade for lack of support



When water-filled subgrades are guilty of non-support they cost you plenty in excessive maintenance. Then the only way to keep roadbeds firm, smooth and stable is to drain the water out and keep it out. You can do this with ARMCO Perforated Pipe.

Efficient, economical subdrainage comes easy with ARMCO Pipe. Unskilled workmen quickly join long lengths with simple band couplers. There are fewer sections to lay—fewer joints to assemble. Installation goes fast and labor costs are low.

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Use ARMCO Pipe for installing complete railway subdrainage systems, or for patching up trouble wherever it occurs. Then you can be sure of a firm, dry foundation under your roadbed. You'll save maintenance dollars and have a safe, smooth track with fewer "slow orders." Write for complete information. Armco Drainage & Metal Products, Inc., 1195 Curtis Street, Middletown, Ohio.

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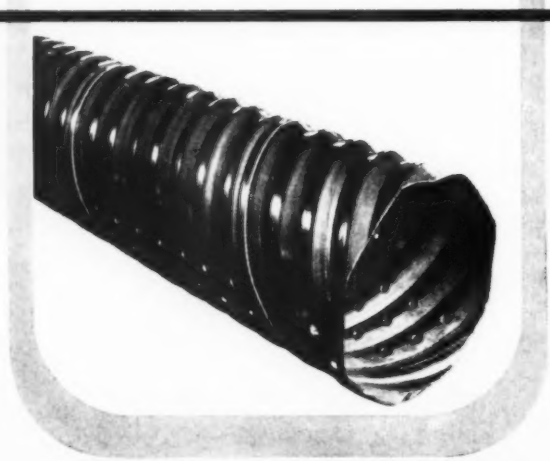

ARMCO

ARMCO PERFORATED PIPE

Make your own check on Continuous Rail Economy Fill in the Answers

What do joints now cost on your railroad, assuming that average rail life is 25 years?

	Cost per year per mile of track
1. Original bars, bolts and washers with labor to install	$
2. Signal bond installed	
3. Flame-hardening rail ends	
4. Tightening track bolts	
5. Tamping joint ties	
6. Maintaining signal bonds	
7. Building up rail ends	
8. Reforming angle bars	
9. Renewing angle bars	
10. Joint tie replacement account of mechanical wear	
11. Replacing fouled ballast account of pumping joints	
TOTAL	$

Continuous rail eliminates practically all of these costs. One railroad estimates that continuous rail, pressure-welded by OXWELD'S methods, saves them $383 per mile per year. You can save from $7,000 to $10,000 per mile during life of rail in first position.

Booklet F-7225 tells how continuous rail is efficiently pressure-welded by OXWELD'S methods. Write for it.

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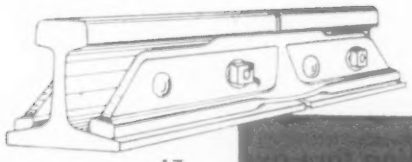
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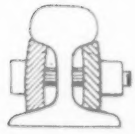
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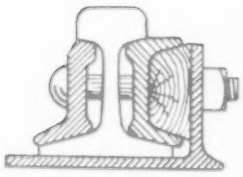
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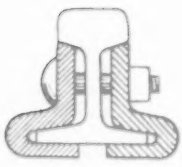
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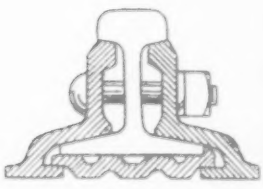
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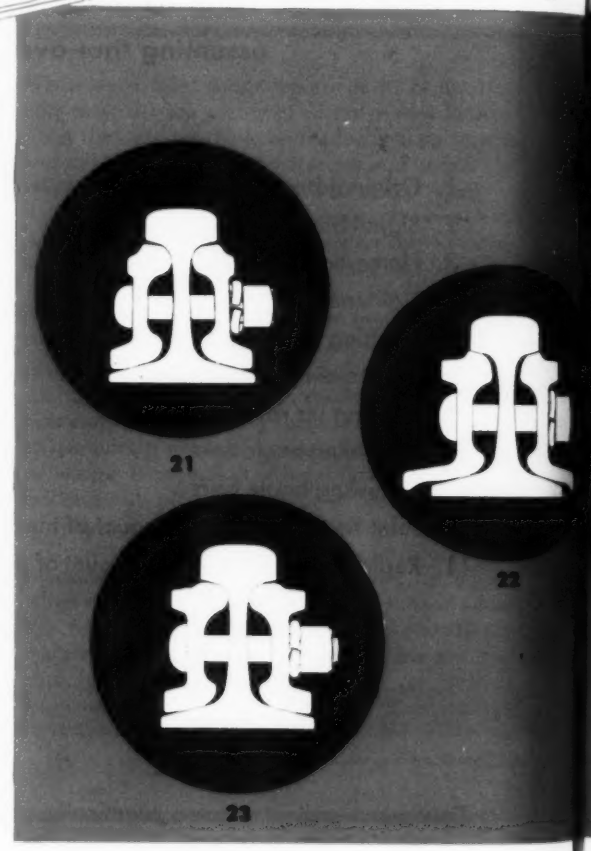
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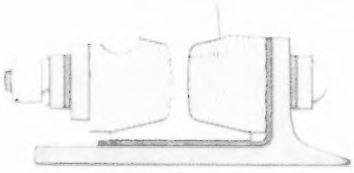
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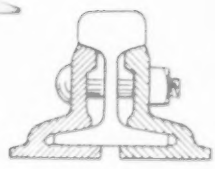
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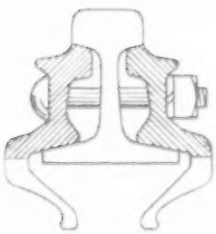
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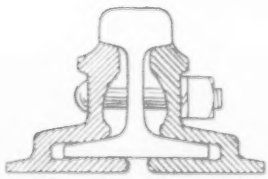
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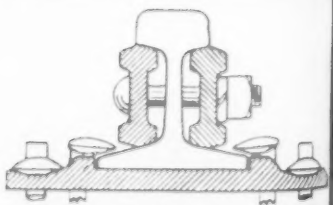
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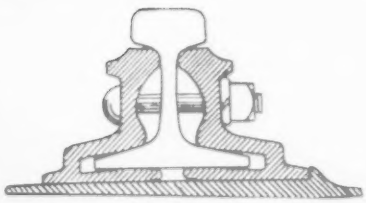
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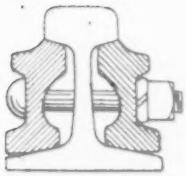
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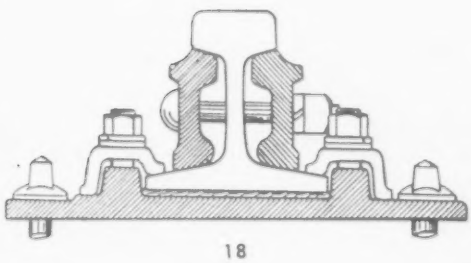
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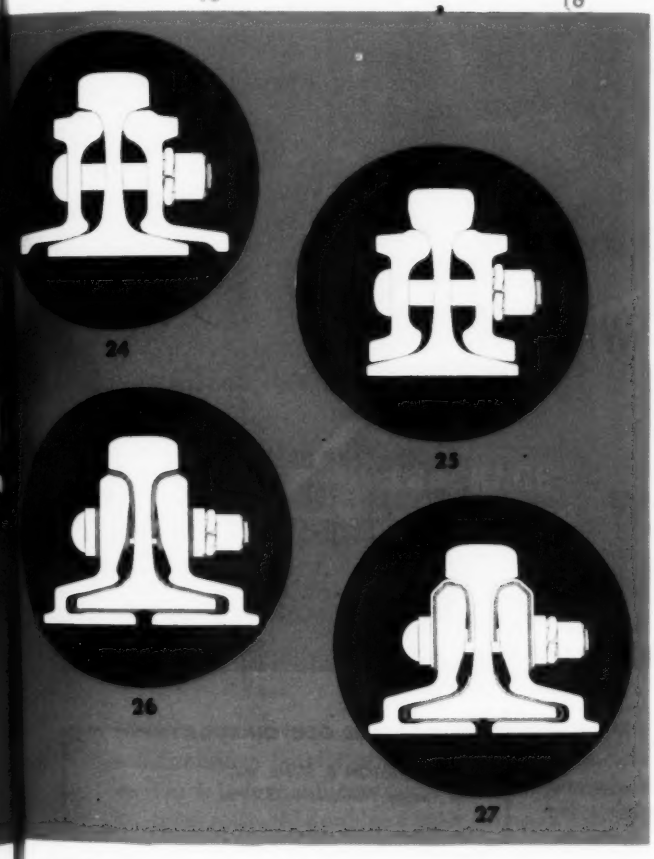

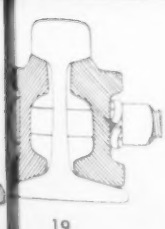
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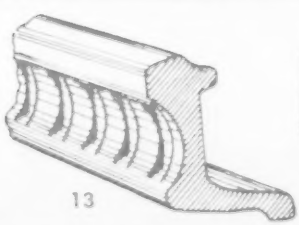
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13	Reinforced Web
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16	Balanced
17	Evertite
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20	Curved Base
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22	Present R.J.Co. Design
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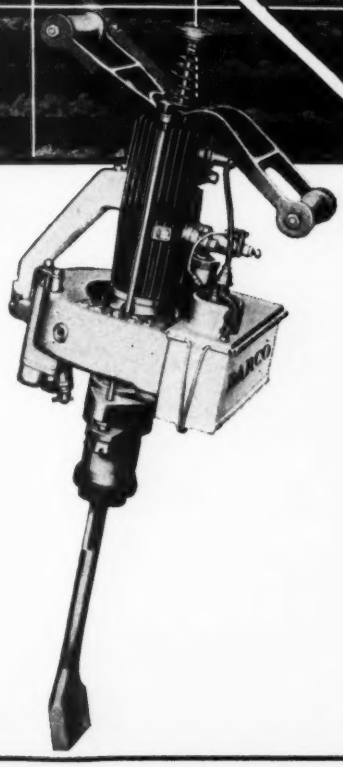

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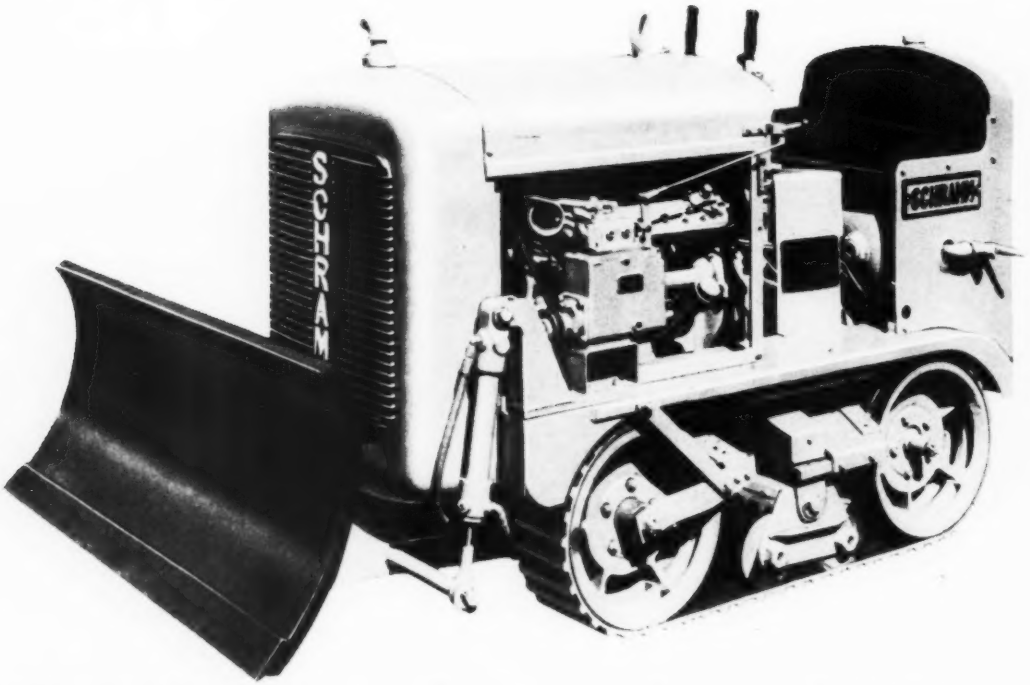

SURPRISING . . . the number of jobs this SCHRAMM No. 60 CRAWLER can do!

What other air compressor has so many uses?

You get more than a compressor when you buy a Schramm No. 60 Crawler. As a light tractor it's a great little pusher and puller. Hook on a backfill attachment to cover trenches and other excavations. Run power tools from its power take-off. Mow and burn weeds. Your own ingenuity will suggest lots of other uses. And remember, with all these extras you still have a hard-hitting compressor supplying 60 cubic feet of actual air per minute at 100 pounds pressure.

Tie tamping. Sheet pile driving. Concrete breaking. Backfill tamping. Sand blasting. Spray painting. These and many other air jobs occur on the railroad and the Schramm No. 60 Crawler does them all because it moves by its own power to any place where the work is, on or off the track. Its crawler treads go anywhere, even up or down the steepest fills. And when you must get there fast, simply run it up on a trailer or rail dolly and be off!

More compact than any other portable compressor of equal capacity, the No. 60 crawler has both the motor and compressor cylinders balanced in a V-8 automotive block. Learn more about these and other features from bulletin FC 48. Ask Schramm's Railway Sales Department for your copy today.

Additional sizes and models of Schramm compressors range from 20 to 420 cubic feet actual air.

SCHRAMM INC.

THE COMPRESSOR PEOPLE
WEST CHESTER
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For additional information, use postcard, pages 219-220

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6 years ago—and still looks good!

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FOUR DIESEL-POWERED MODELS — all full-fledged construction machines — each one easily handles all types of grading work—sloping, backfilling, ditching and diking, widening cuts and fills, building and widening access roads along right-of-way . . . as well as cutting out and reshaping ballast, cleaning and maintaining ditches, snow removal and scarifying. Differences in weight, speeds, horsepower and cost enable you to match the machine to the job to be done . . . and to your budget.

LOW COST W-SPEED PATROL — long popular as an economical machine for such jobs as cutting out mud heaves beyond ballast toe, cutting rock ballast from tie ends, widening shoulders, general right-of-way and road maintenance. The W-Speed Patrol is compact enough to work effectively on narrow shoulders, wherever space is limited. Gasoline powered, electric lights and starter, simple-to-operate controls.

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NO INTERRUPTION of either traffic or maintenance work. Operating free of tracks, Allis-Chalmers Motor Graders keep working while trains go through on schedule.

SAME OUTSTANDING ADVANTAGES ON ALL AD AND BD MODELS

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that fits the job

- A strong, shock-absorbing tubular frame that also protects control rods inside frame.
- High axle and throat clearance for handling bigger windrows without interference.
- Rounded construction of steering knuckles, spindles and drag links to prevent material from packing . . . assures unhindered operation.
- "Roll-away" moldboard that rolls instead of pushes material and thus speeds up work.
- A full circle revolving blade that allows grading forward or in reverse.
- A blade held firmly on its work, through direct down pressure, for precision cutting.
- A smooth-running, economical GM 2-cycle diesel engine that packs power in every stroke.
- Complete operator comfort with full vision, responsive controls, self-energizing brakes.

VERSATILE

FOR ALL KINDS OF USERS
FOR ALL TYPES OF MAINTENANCE

W-SPEED PATROL
31.5 brake hp. • 6,000 lbs.

BD-2 50.5 brake hp. 17,772 lbs.

BD-3 78 brake hp. 19,043 lbs.

Rear end of cleaning unit, showing disposal conveyor above, ejecting waste to the side, and delivery conveyor below distributing cleaned ballast.

Ballast Cleaner includes two units: a towing and digging unit shown at the right, and a Diesel-powered cleaning unit behind. An endless scraper chain passing beneath the track excavates the ballast, which is elevated first by the digging chain itself and then by a belt conveyor to vibrating screens, where it is freed of waste and conveyed to a chute for redistribution beneath the ties.

2 *new* machines

Also: Universal Bolt and Tie Screw Driving Machines, Rail Drilling Machines, Tie Drilling Machines, Pulsators, Motor Rail Trucks

The Matisa Automatic Ballast Cleaner and the Matisa Automatic Tie Tamper, both developed in Switzerland and experienced in track maintenance service in England, France, and Belgium in the past 12 years, are now available to American railroads.

Both are self-propelled on-track machines. Output for the Ballast Cleaner is 150 to 240 lineal feet of track per hour of actual uninterrupted operation, depending on ballast conditions. The Tie Tamper, requiring only one man to operate, will tamp 400 to 600 feet of track per hour under normal conditions.

Full details and work records on request.

Front view of the power tamper

The MATISA EQUIPMENT CORPORATION
206 S. Michigan Ave., Chicago 4, Ill.

EQUIPMENT COMPANY
58 Victoria St., London S.W.1, England

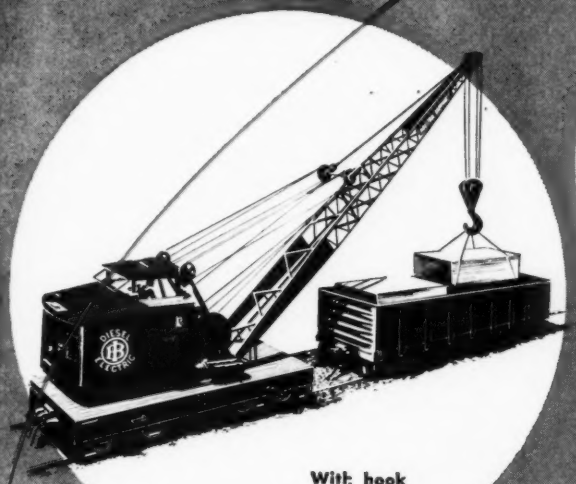
MATERIEL INDUSTRIEL, S. A.
2 Grand Pont, Lousanne, Switzerland
30 Rue de Mogador, Paris, France

MATERIAIS INDUSTRIAIS, S. A.
277 Av. Rio Branco,
Rio de Janeiro, Brazil

Opposed pairs of tamping tools work from each side of a tie, vibrating rapidly while being forced toward each other until desired compactness of ballast under tie is attained.
Two complete tamping mechanisms (one on each side), each comprising 8 tamping tools working in pairs, 4 inside and 4 outside of rail, are raised and lowered by means of compressed air. They are mounted on the Tie Tamper, which is powered and propelled by a combustion engine

BROWNHOIST

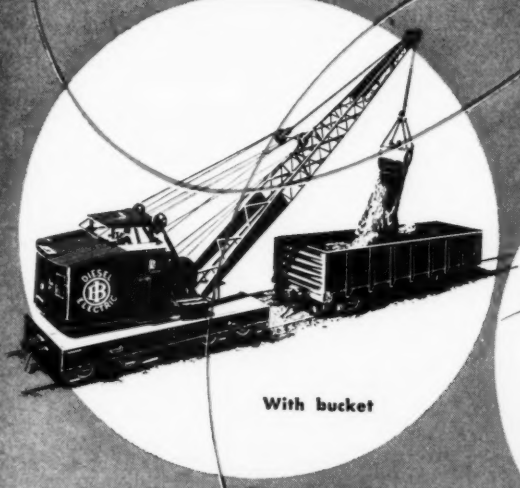
let George do it!



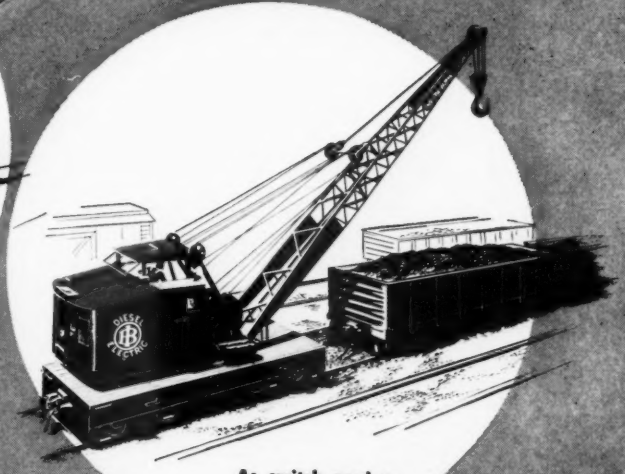
With hook

With magnet

"Let Brownhoist do it" has become the slogan in more and more industries where there's a tough materials handling job to do. The reason is simple. The new Industrial Brownhoist Diesel Electric Locomotive-Crane is a most versatile worker—it performs equally well as a switch engine or as a crane operating with magnet, hook or bucket. Standard models available to meet every capacity requirement. D.E.-30, D.E.-50, D.E.-60. Plan to reduce your materials handling costs, today, with a Brownhoist Diesel Electric Locomotive-Crane. Write for complete particulars.



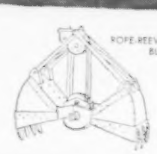
With bucket



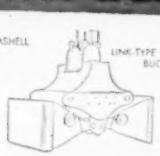
As switch engine

BROWNHOIST

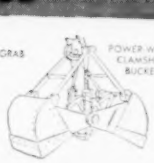
builds better cranes



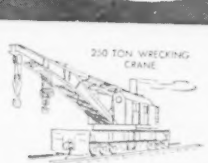
ROPE-REEVE CLAMSHELL BUCKET



LINK-TYPE ORE GRAB BUCKET



POWER-WHEEL CLAMSHELL BUCKET



250 TON WRECKING CRANE

COAL—ORE BRIDGE

INDUSTRIAL BROWNHOIST CORPORATION • BAY CITY, MICHIGAN

DISTRICT OFFICES: New York, Philadelphia, Cleveland, Chicago. **AGENCIES:** Detroit, Birmingham, Houston, Los Angeles, Portland, San Francisco, Seattle, Spokane. Canadian Brownhoist Ltd., Montreal, Quebec.

...Mark of PROGRESS in Railroading

Lower-c

Erie Railroad sells "Velvet Track"

BALLASTED BY PULLMAN-STANDARD POWER TRACK BALLASTER

(This advertisement ran in national magazines in December.)

Thanks to the "Rolling Bird Cage"

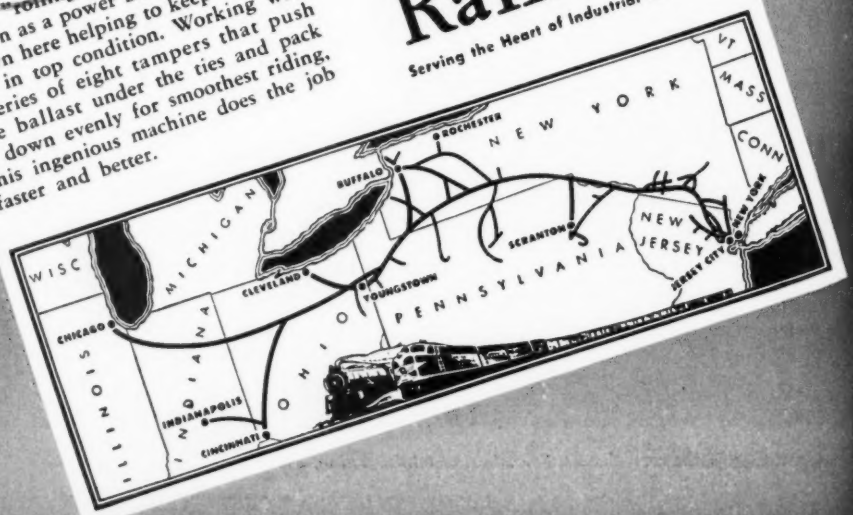
ANY RAILROAD MAN will tell you that the key to smooth riding for both passenger and freight trains is a well-maintained, stone ballast roadbed. So it's small wonder the Erie is proud of its main line, completely stone ballasted all the way from New York to Chicago.

Erie's **"rolling bird cage"** (properly known as a power ballast machine) is shown here helping to keep the roadbed in top condition. Working with a series of eight tampers that push the ballast under the ties and pack it down evenly for smoothest riding, this ingenious machine does the job faster and better.

Of course, the power ballast machine is only one of the important reasons for Erie's famed roadbed—one of the best maintained in all America. It does point up how Erie's progressive railroading works continuously and efficiently on the job of providing safe, dependable transportation for both passengers and freight.

Erie Railroad

Serving the Heart of Industrial America



-cost Ballasting pays for machine ...

"Mechanization of track maintenance is one of the fastest-moving trends in railroading today"... Power Ballaster machines produce better work for about half the cost.

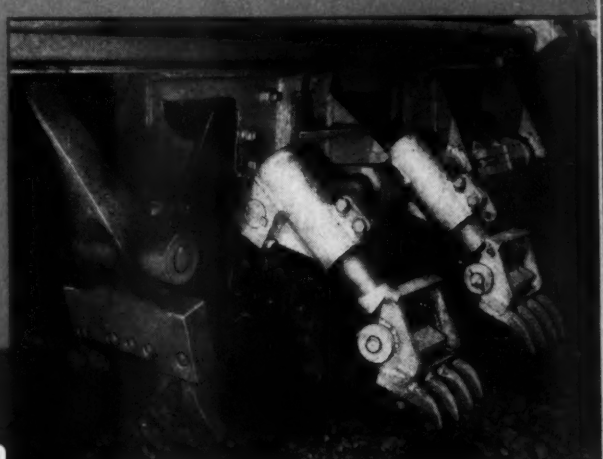
Investigate the savings per mile of track earned by the Pullman-Standard Power Ballaster, as compared with any other kind of ballasting operation. You'll find how quickly these machines will pay for themselves out of time and money saved.

Compare the work. Not only is the Power Ballaster amazingly faster, but it turns out a uniformity of ballast compaction unrivaled by other tamping methods.

These machines operate successfully in all types of ballast, with any track lift. And their economy of operation permits comprehensive spotting operations—track base correction, tightening loose ties—with or without a slight track raise. Mechanize your track improvements, and *sell* the advantages of smoother-riding trains. Write for complete information and comparative operating cost studies.

***New!* BALLAST FEED SHOE ATTACHMENT**

Cut shows tamping shoes at low position along the tie base. Ballast feed shoes are in extended position; these work the loose ballast back between the ties, as needed. Now available for machines in service.



Power Ballaster Division

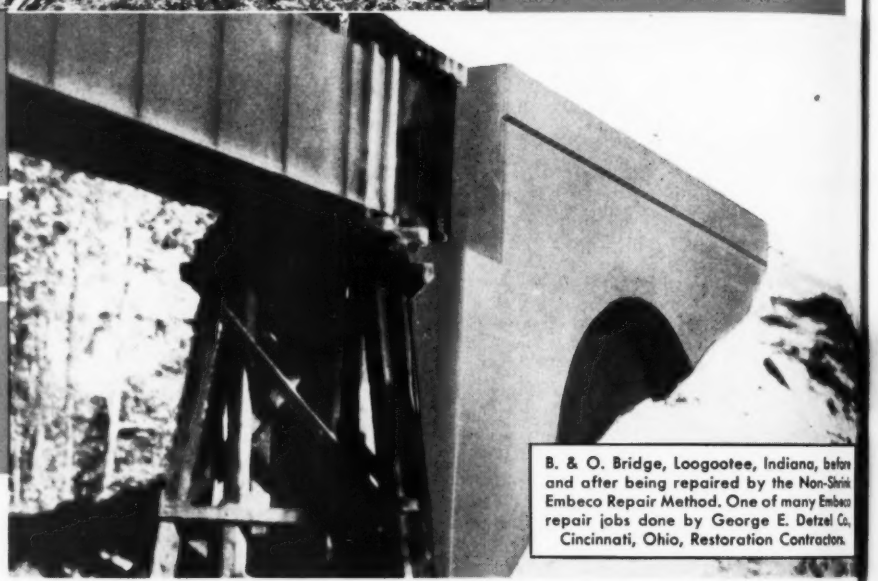
79 East Adams Street, Chicago 3, Illinois

Pullman-Standard

CAR MANUFACTURING COMPANY

BEFORE

AFTER



B. & O. Bridge, Loogootee, Indiana, before and after being repaired by the Non-Shrink Embeco Repair Method. One of many Embeco repair jobs done by George E. Detzel Co., Cincinnati, Ohio, Restoration Contractors.

Non-Shrink EMBECO Repairs Assure Many Additional Years Service

Cost-minded railroads that want to keep down maintenance expense are bringing their properties up to the requirements for safe, adequate and modernized transportation by the Non-Shrink Embeco Repair Method.

By eliminating all shrinkage in mortar and grout, Embeco insures a strong bond and long-life repairs. Non-Shrink Embeco has been successfully used for fifteen years for grouting bridge, turntable and heavy machinery bed plates, repointing old stone structures, reintegration of concrete masonry piers and abutments and the application of gunned concrete for tunnel lining, repairing and retaining walls, dams, abutments and piers.

Write for full information.

Visit us at Booths 173-174 National Railway Appliances Assoc. Show March 14-17

the MASTER BUILDERS

CLEVELAND 3, OHIO TORONTO, ONTARIO

ONE-MAN GANG DIGS DRAINAGE DITCHES

Widening and ditching this cut will keep water off the newly rebuilt roadbed. And the job is quickly and easily done by an International TD-9 Diesel Crawler equipped with an angle dozer. It's just one of the many maintenance-of-way jobs where International Crawlers add new economy and efficiency to the operation.

Your International Industrial Power Distributor will show you how International Crawlers, matched with dozers, scrapers, cranes and other mounted equipment become extremely versatile and practical tools all along the line. He sells and services the best in off-the-track power — International Power. Let him show you why International is your best buy for dependability, economy and all around performance—your best buy to get work done.

INTERNATIONAL HARVESTER COMPANY
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LISTEN TO JAMES MELTON ON "HARVEST OF STARS" EVERY WEDNESDAY EVENING ON CBS.

CRAWLER TRACTORS
WHEEL TRACTORS
DIESEL ENGINES
POWER UNITS

INTERNATIONAL INDUSTRIAL POWER

Standardize on Power that Pays

fait accompli!

FROM "Dream" to "Delivery" is sometimes a long, rocky haul. And the road to Nowhere is paved with good ideas that haven't been delivered. So it's news that the American DIESELECTRIC Locomotive Crane is a *fait accompli* . . . a thing accomplished . . . a reality.

Not just one or two, or a dozen, but scores of these revolutionary cranes are today in use on the railroads and in industry, all over the country. Owners are proud to show them in action . . . proud to report specific facts and figures from the acid test of *on-the-job experience.*

It was a great achievement, this blending of diesel power and electric power in a locomotive crane. With diesel power to the deck, electric power to the trucks, the American DIESELECTRIC has upset all previous concepts of what a crane can do. For this is the fact: by its greater work output and its sensationally low maintenance cost, this massive, powerful crane actually *writes off its own cost in five years.*

Would you like to read the story of the DIESELECTRIC? Mail the coupon below, for new descriptive catalog.

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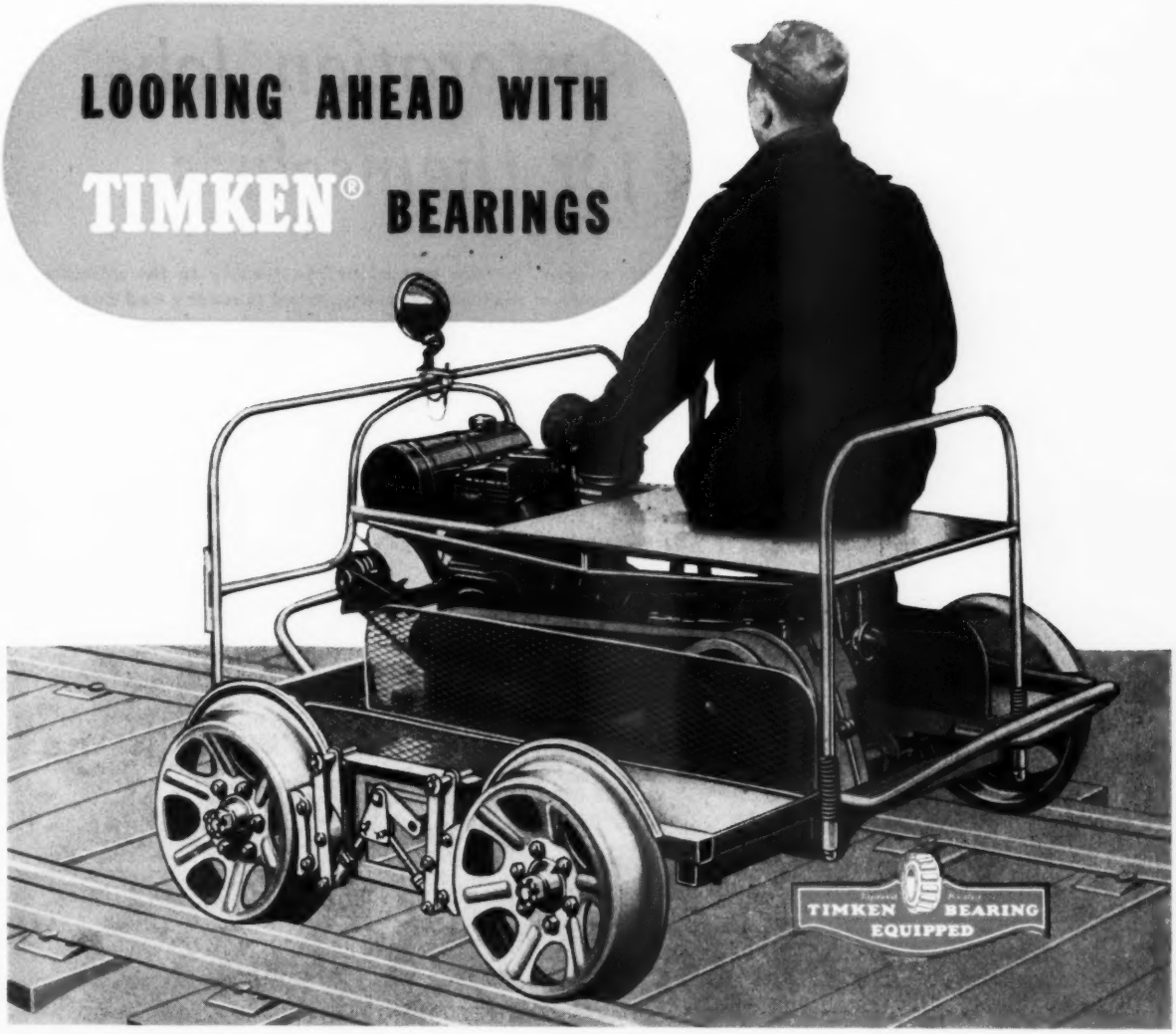
LOOKING AHEAD WITH TIMKEN® BEARINGS



This is Northwestern Motor Company's new Type 538R light one-man section car — a two-man capacity car designed for one-man handling. Running weight, 600 lbs.; lift weight, 140 lbs.; speed, 35 miles per hour.

Like all Northwestern motor cars, the Type 538R is equipped with Timken tapered roller bearings on all axles for smooth, friction-free operation; protection against radial, thrust and combined loads; minimum operating and maintenance attention.

In addition to the axle applications, Timken bearings also are used in the reversible tilting transmission which is pivoted to the driving axle and serves as a belt tightener as well.

Make sure you have main line equipment performance in the section cars you build or buy; insist on Timken bearings. The Timken Roller Bearing Company, Canton 6, Ohio. Cable address "TIMROSCO".

TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

Detzel Restoration Jobs *speak for themselves*

THE pictures below give "before and after" testimony to the effectiveness of DETZEL methods of restoring disintegrated masonry and concrete structures.

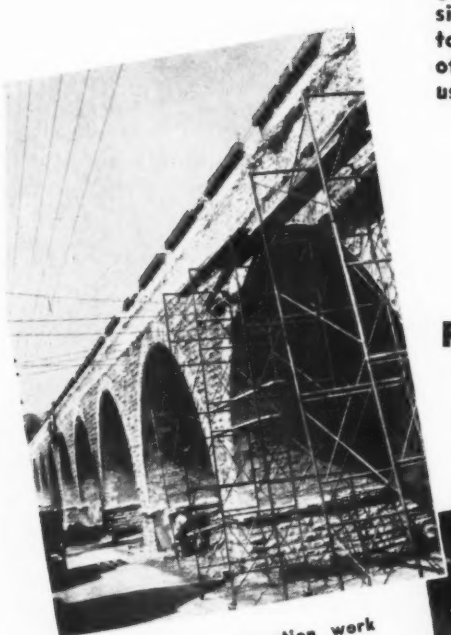
Every DETZEL job is the work of skilled men using modern grouting and "GUNITE" equipment under expert supervision, and our experience enables us to undertake any restoration project, however large or small, with assurance of complete satisfaction to the customer. This work can usually be executed without interruption to traffic.

Let DETZEL engineers help with your maintenance problems concerning masonry piers, abutments, railroad bridges, retaining walls . . . dams, power plants . . . steel encasements . . . linings for tanks, tunnels, canals, ditches.

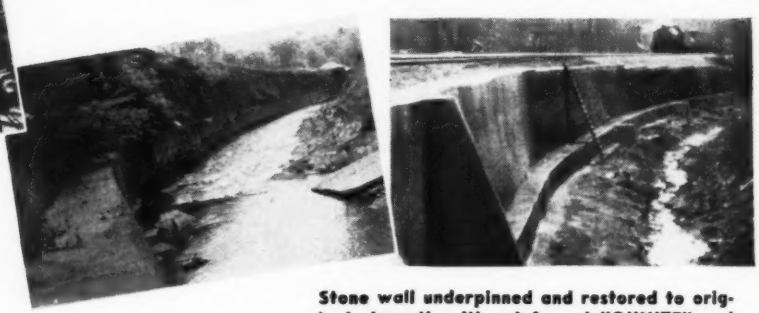
Pressure Grouting and "GUNITE" Service

GEORGE E. DETZEL COMPANY

2303 Gilbert Avenue, Cincinnati 6, Ohio



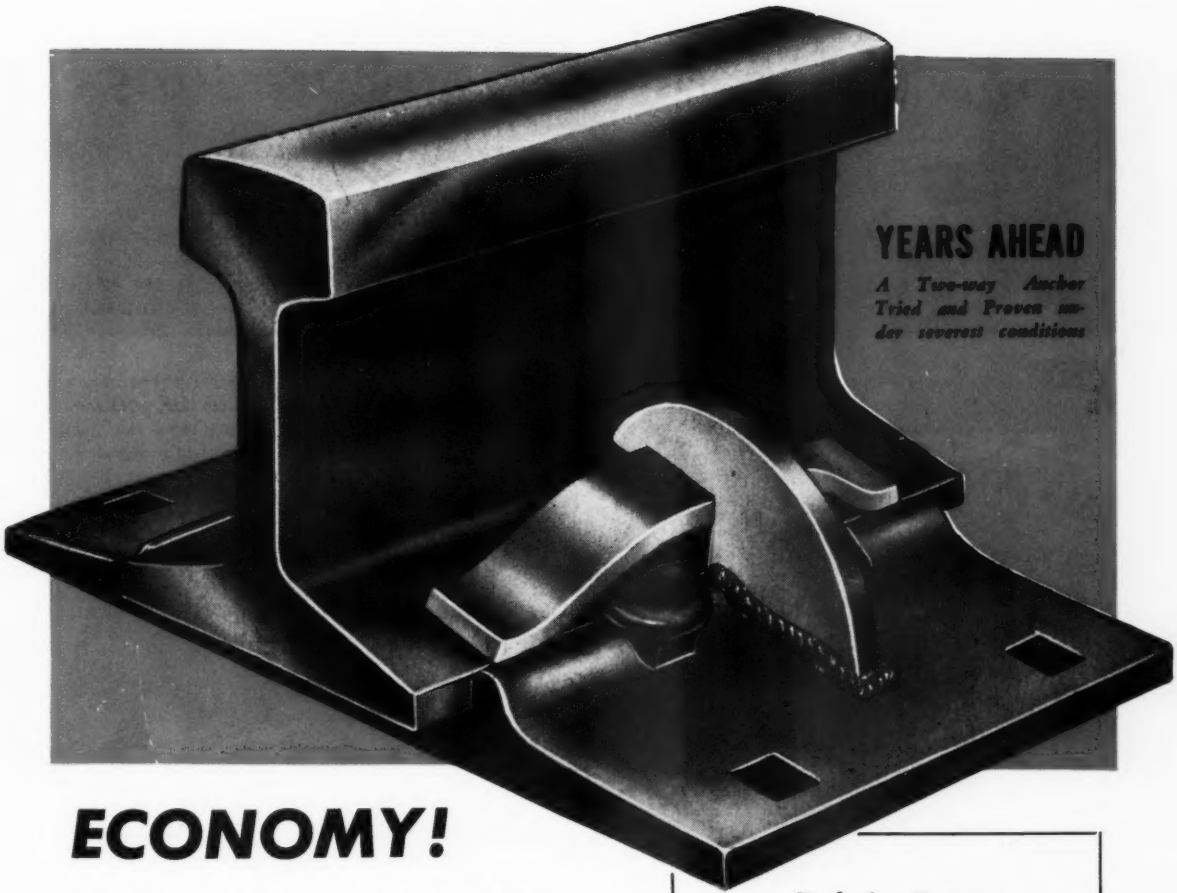
After DETZEL restoration work the result is sturdy masonry.



Stone wall underpinned and restored to original strength with reinforced "GUNITE" and DETZEL services.

Stone parapets, back wall, and seat replaced with reinforced concrete; balance of stonework pressure grouted and sealed with "GUNITE."

Write for interesting illustrated bulletin on projects undertaken by our organization.



ECONOMY!

How much do you spend annually to re-set or adjust rail anchors?

This new anchor, with compensating spring to take up for wear and erosion, requires no attention whatever after it has been installed in track.

Price is 25¢ each

Exclusive Features

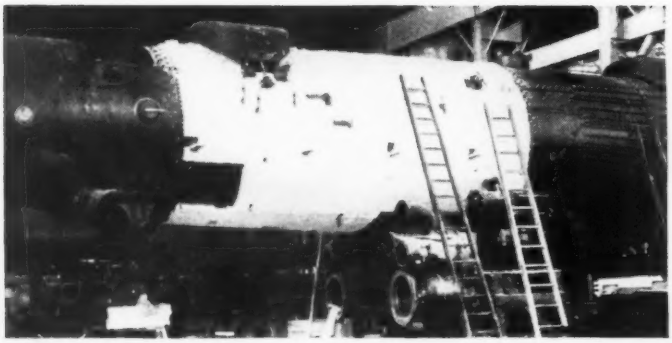
1. All Anchor Maintenance eliminated.
2. Failures eliminated.
3. Cannot be injured during installation.
4. A one piece (after weld is made) two-way compression anchor.
5. All Springs compressed an equal amount—do an equal share of work.
6. Remains constantly engaged from time it is installed.
7. Long spring—last third of distance spring is deflected, poundage does not increase. This is a compensating factor to take up for wear and erosion.
8. UNIVERSAL: This two-way anchor is applicable to any weight of rail or design of tie-plate and is JUST AS EFFECTIVE ON RELAID, WORN RAIL AS ON NEW RAILS.

The New
NO-CREEP RAIL ANCHOR

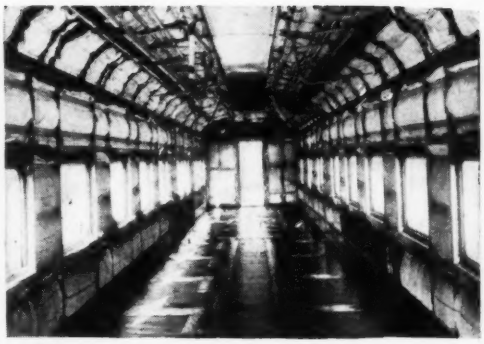
Simplicity is the greatest asset of this anchor. All we ask is that you investigate and compare the eight claims listed above as being exclusive. Write for further particulars.

G & H RAIL CONTROLS, INC.

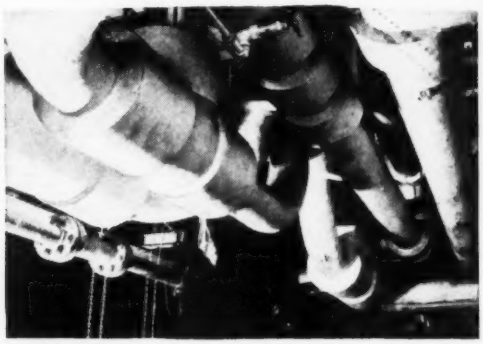
Phone BE 8117 **5204 E. 15th St., Bill Glover Bldg.** **Kansas City 1, Mo.**



To save on locomotive operation—Use J-M 85% Magnesia Locomotive Boiler Lagging. Combines high insulating value with light weight and the ability to retain its efficiency in service. Furnished in various thicknesses, curved or flat, straight or tapered, to permit snug fit to boiler surfaces.



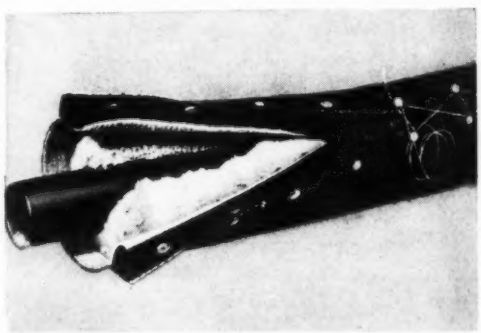
To save on passenger car operation—Insulate with J-M Stonefelt blankets for permanently high thermal insulation efficiency, lower air conditioning costs over the years. Stonefelt retains its rated thickness . . . won't settle with vibration. In addition, it is both fire- and moisture-resistant.



To save on power plant operation—Use 85% Magnesia, the most widely used insulation for steam lines up to 600° F. Light in weight, uniform in composition, it keeps fuel costs low, provides dependable insulation that often outlasts the installation.

...there is a type for every railroad requirement...

Johns-Manville manufactures many types of insulations for railroad use...for refrigeration cars, cold-storage rooms, tank cars, air-conditioning systems, locomotive fire-boxes, soundproofing. In addition, the completely equipped Johns-Manville Insulation Laboratories are available to help you find answers to new insulation problems. For further details, write Johns-Manville, Box 290, New York 16, N. Y.



To save on train operation—Use J-M Train-Line Insulations for steam piping, and hot and cold water and air-conditioning lines. Made of materials that maintain high efficiency under severe conditions of moisture and vibration and temperatures up to 450°F.

Johns-Manville

91 YEARS OF SERVICE TO TRANSPORTATION

TEAMWORK THAT CUTS MAINTENANCE COSTS

One of the Blue Brute Track Teams at work in the Boston & Albany Railroad yards at Springfield, Mass.

Count on this perfectly matched Blue Brute Track Team to do a lot of fast, efficient tamping, on very little air! The Hand-i-Air Compressor is as tough as they make 'em yet easily handled by two men. Through its easy-breathing Feather* Valves, this tireless, two-wheeled tornado delivers a steady supply of 60 cu. ft. per min. — ample for its four Blue Brute teammates.

They're the WTT-7 Tie Tampers. Men do *more* work with these light, precision-balanced 42-pounders — and do it *easier* and *faster* — while advantages like the leak-proof throttle and anti-freeze design mean tops in efficiency and economy under all conditions.

Adding up, here's teamwork that will surface more lineal feet of roadbed per day — every day. Such performance, remember, is typical of all Blue Brutes — the grouters, contractors' pumps, portable concrete mixers, air tools, etc. — that are cutting maintenance and construction costs all along the line. Checking on them — thoroughly — will be a smart move towards saving money in your own operations.

*Reg. U. S. Pat. Off.

H8-4

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Worthington Pump and Machinery Corporation,
Construction Equipment Dept.
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Distributors in All Principal Cities

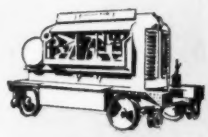
BUY BLUE BRUTES

60' Portable Compressor

Portable Concrete Mixer

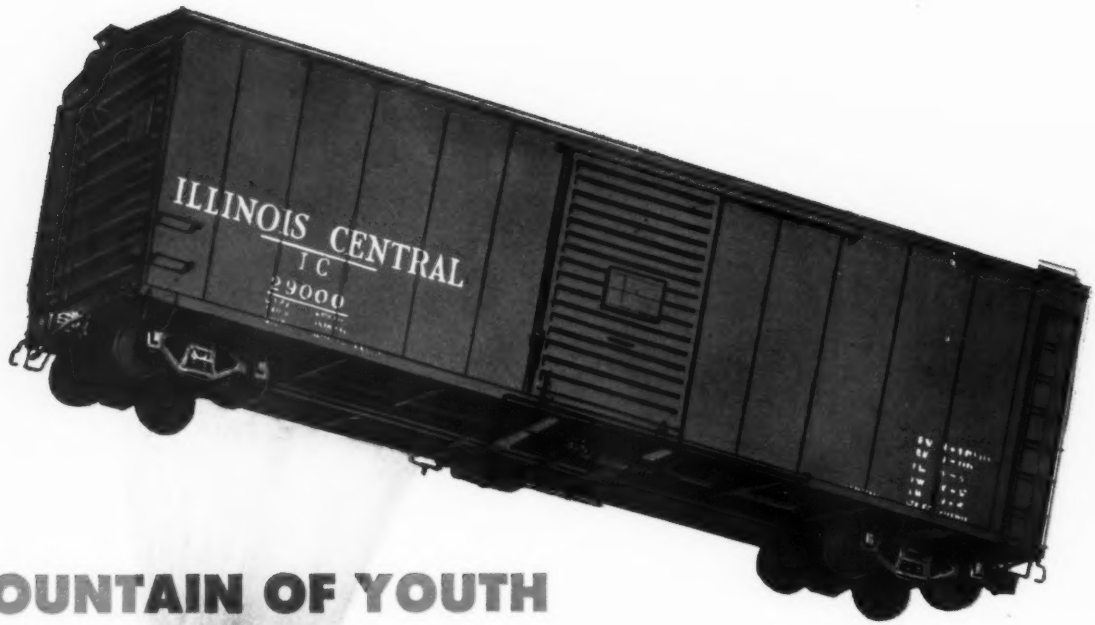
Self Priming Centrifugal Pump

Hand Held Air Tools

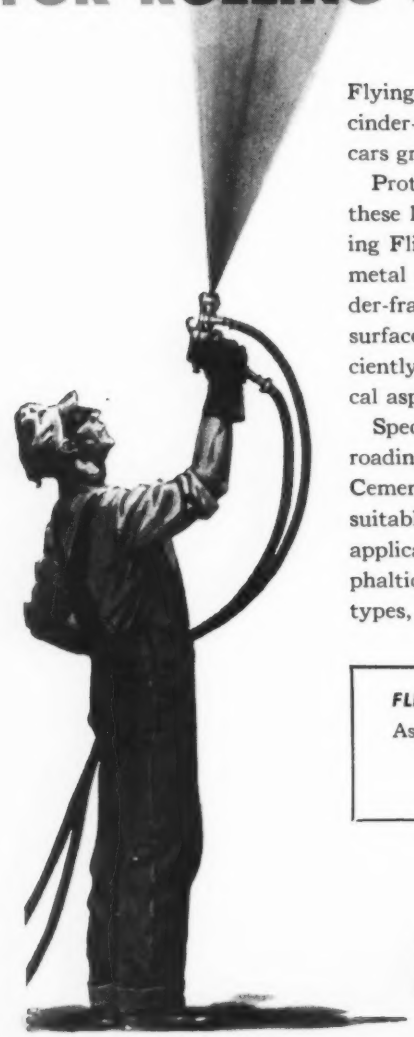


Railcar Compressor

FOR EVERY CONSTRUCTION AND MAINTENANCE JOB



FOUNTAIN OF YOUTH FOR ROLLING STOCK



Flying gravel, seeping moisture and cinder-laden wind can make freight cars grow old fast.

Protect your rolling stock against these hazards with tough, quick-drying Flintkote Car Cements. Couplers, metal ends, slope sheets, trucks, under-frames . . . any vulnerable metal surfaces . . . can be quickly and efficiently protected with these economical asphalt-base compounds.

Specially formulated to meet railroading requirements, Flintkote Car Cements are available in consistencies suitable for spray, brush or trowel application. Or, you can specify asphaltic emulsions of a wide range of types, fibrated or non-fibrated. Flintkote Railroad Emulsions are "tops" in withstanding weather and severe exposures in the railway field.

More than forty years of research and successful experience are behind the manufacture of Flintkote Railroad Products. Our technical specialists are ready to cooperate with you in the solution of individual problems. Write today, and learn more about Flintkote's fountain of youth for your rolling stock.

THE FLINTKOTE COMPANY
INDUSTRIAL PRODUCTS DIVISION
30 Rockefeller Plaza, New York 20, N.Y.

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Asphalt Protective Coatings . . . Car Cements . . . Insulation Coatings . . . Cold-Laid Mastic Flooring Emulsions . . . Building Materials . . . Materials for Waterproofing and Dampproofing.

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Products for Industry

The IMPROVED

GAUTIER

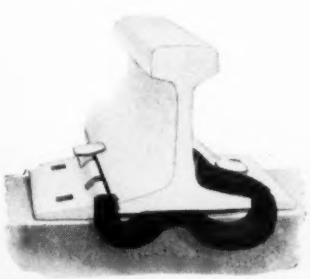
. . . IT CAN'T BE OVERDRIVEN!

RAIL ANCHOR

IT'S been tried—tested—proved . . . and it can't be overdriven. That's the story of the Improved GAUTIER Rail Anchor.

A heavy one-piece anchor that can be applied with a spike maul . . . it is engineered scientifically with no concentrated stresses but with considerable "take up". It can be applied and reapplied on new or old rail without impairing its holding power.

Visit our booth No. 181 at the National Railway Appliance Association — March 14-17 Coliseum, Chicago



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Saves Labor, Time and Tempers

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★ **Light in weight — Less than 60 lbs.**

★ **Patented, special alloy spring assembly throws the hammer and cushions the recoil. No shock on operator. No manual pressure needed to compact ballast.**

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★ **Maintenance cost is low — extremely simple assembly of few working parts, reduces replacements and repairs below all previous standards.**

Three years of field service prove the RACINE Unit Tamper superior. It is lighter in weight, easier to carry, trouble-free and long-lived.

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For additional information, use postcard, pages 219-220

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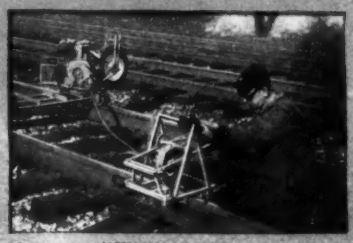
track maintenance machinery . . .



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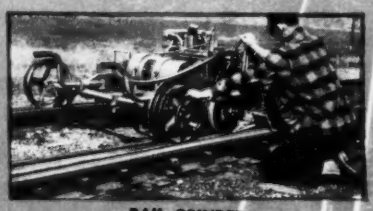

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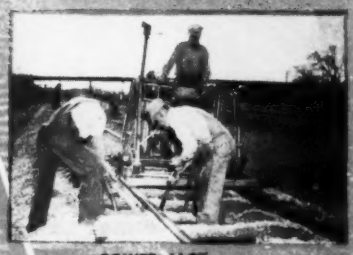

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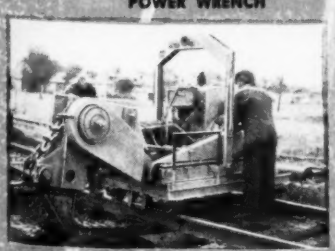

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on the Model HM or on other sizes of Hough Payloaders—the 1¼ cu. yd. Model HL, the ¾ cu. yd. Model HF, the 10½ cu. ft. Model HA.

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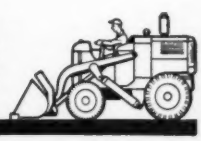

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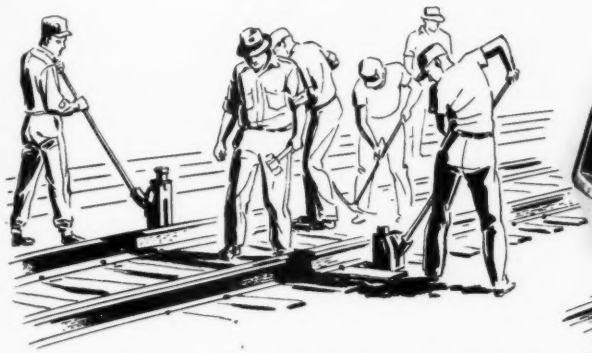

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Jack No.	Capacity Tons	Height Inches	Raise Inches	Base Inches	Head Inches	Foot Lift Ht. Inches	Weight Pounds
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117A*	15	22	13	6½ x 11	3 x 3	2	42
217	15	16½	7½	6½ x 11	3 x 3	2	52
617	15	28	18½	7 x 12	3 x 3	2	75
517	15	11	5	6½ x 10¼	3 x 3	2	40

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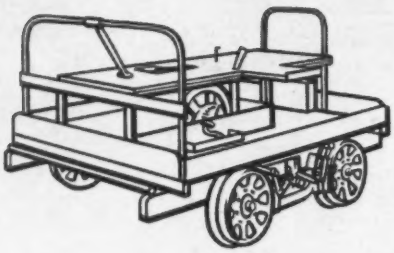
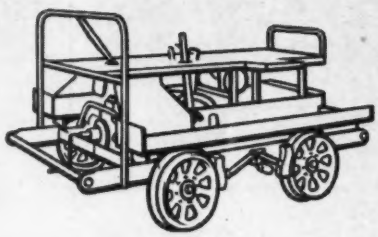
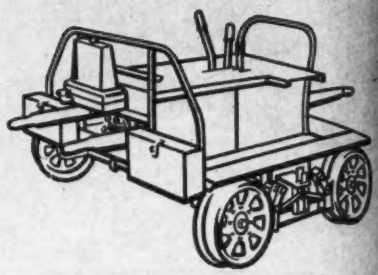


Model 44-B
Standard section car on many roads; powered to haul trailers with men, tools and/or ties.



Model 40-B
Heavy-duty section car; four speeds forward and reverse.



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The better you'll like 'em...

Rail cars built the way railroad men want them . . . with ample power, more convenience and added comfort that make short rides a snap, long rides a pleasure . . . Fairbanks-Morse rail cars . . . first on the roads, *and still* first! Fairbanks, Morse & Co., Chicago 5, Ill.

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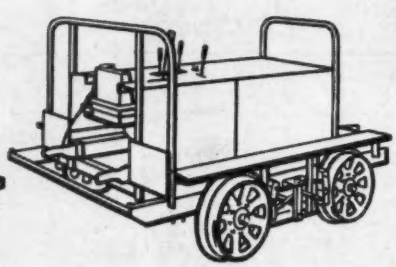
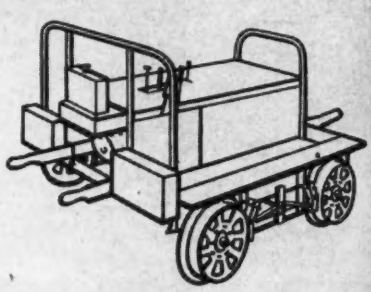
Model 53
6-to-8 man standard section car showing comfort-adding metal cab.



Model 58
Light section car; for 6 to 8 men.



Model 54-D
1-to-4 man inspection car; powerful brakes.

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

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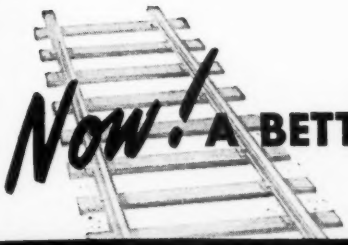

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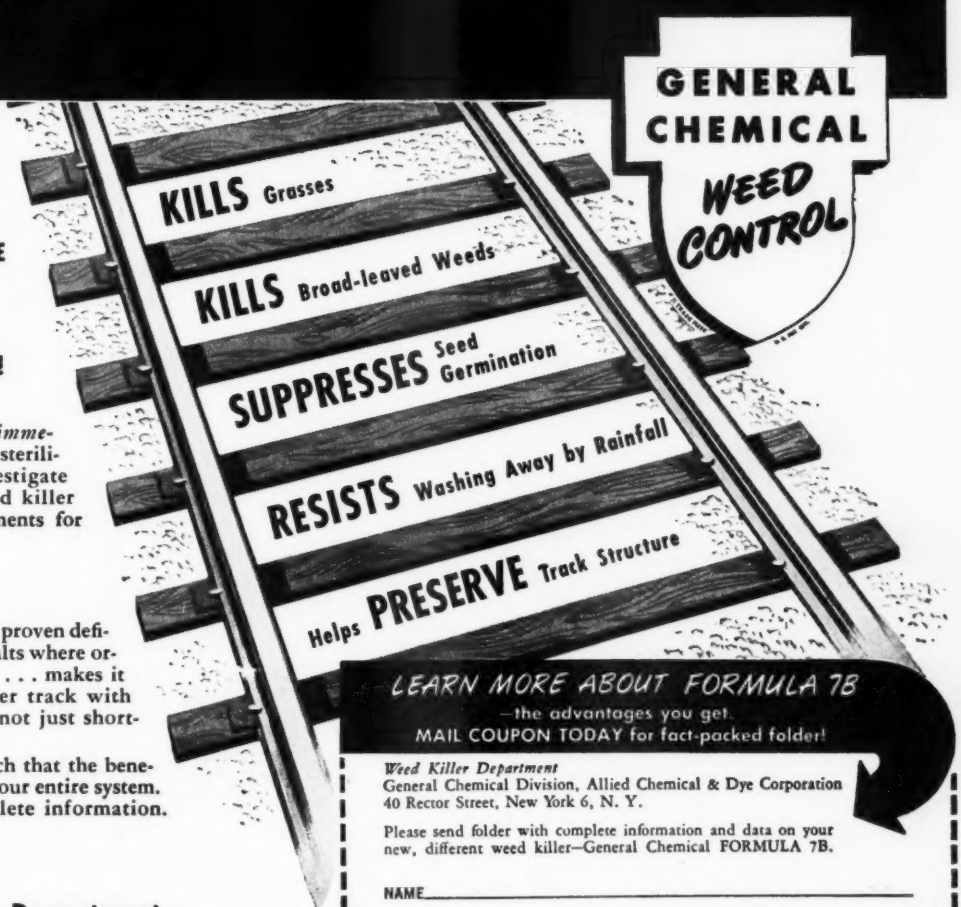

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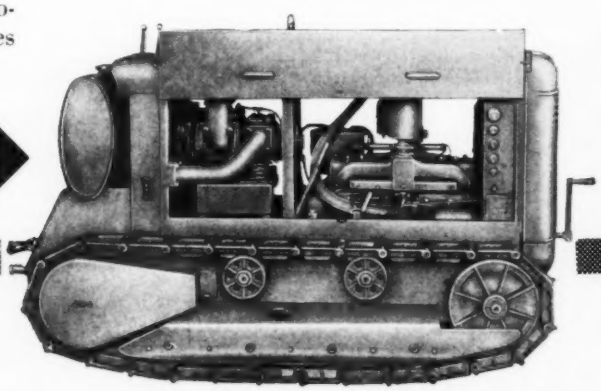

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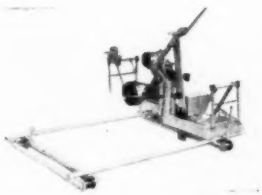
WOOLERY MODEL N TIE CUTTER

Allows tie removal with little or no ballast disturbance and no deep trenching. Cuts ties in 3 sections for easy removal. Special steel blades and overall rugged construction for long service. With WOOLERY undercarriage, you can cut both ends of the same tie without turning machine around.



WRITE FOR BULLETIN No. 171

WOOLERY JOINT OILER

Self propelled off track type . . . powered by 4 cycle air cooled engine. 25 gal. tank with heater allows heavier type lubricants to be used for longer lasting oiling. Three man operated . . . oils up to 1½ miles of track per hour.

WRITE FOR BULLETIN No. 175

WOOLERY PB-B WEED BURNER

3 burner type, mounted on all steel trailer pulled with motor car. Space for 4 - 55 gal. fuel oil drums. Two operators required. Burns 15 foot swath first trip, up to 25 feet by making second trip. Ideal small type weed burner for all kinds of weeds.

WRITE FOR BULLETIN No. 170

WOOLERY TIE PLATE SPACER

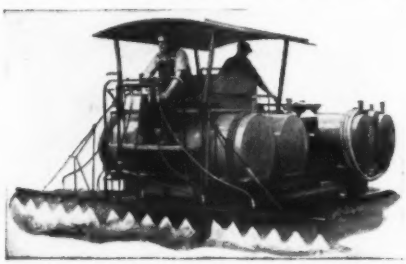
Speeds up rail laying . . . quickly locates single or double shoulder plates at proper distance from other rail. Simple adjustment allows for changes in rail sizes. Rugged, light weight, one man can easily handle on or off the track.

WRITE FOR BULLETIN No. 172

WOOLERY CREOSOTE SPRAYER

Economically sprays creosote to each newly adzed tie. Hand pump regulates amount of spray. Burner efficiently heats creosote for greater penetration. Skin burns avoided . . . clothing protected due to hood shield over spray. Two men can easily operate the spray.

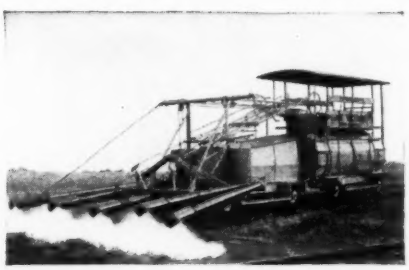
WRITE FOR BULLETIN No. 154



WOOLERY COMBINATION SPRAYER AND WEED BURNER

Permits chemical spraying or burning weeds as desired. Spray width of 18 feet for chemical sprayer. Regular PB burning unit at opposite end. 15 foot burning swath first trip. Up to 25 feet with a second trip.

WRITE FOR BULLETIN No. 174



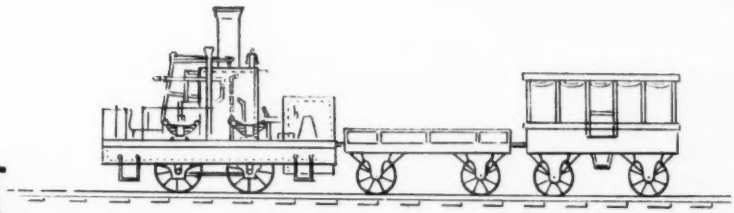
WOOLERY GIANT OCTOPUS WEED BURNER MODEL—WBZ

5 burner type destroys a swath of weeds 25 feet wide in one trip or to 35 feet by making a second trip with arms extended. All burners controlled from the operator's seat.

WRITE FOR BULLETIN No. 169

WOOLERY MACHINE COMPANY

MINNEAPOLIS — Pioneer Manufacturers of — MINNESOTA



WHEN THIS LOCOMOTIVE WAS IN SERVICE HUBBARD TOOLS WERE PRODUCED LIKE THIS

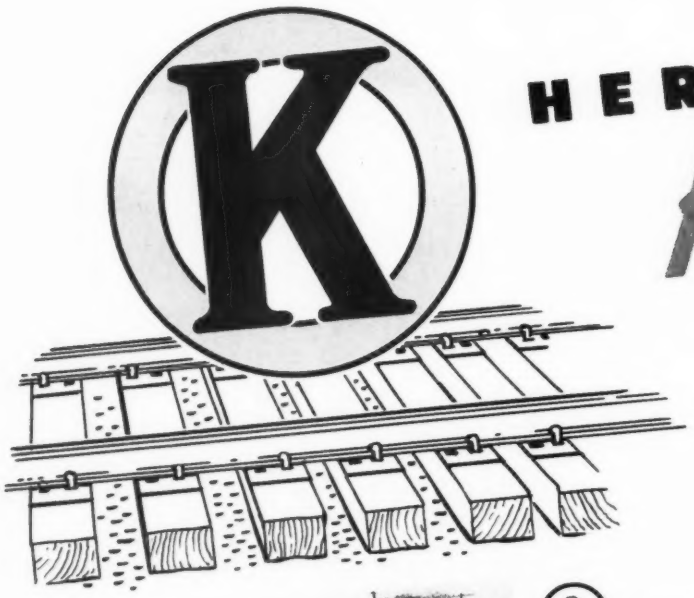
TODAY MODERN METHODS REFLECT 106 YEARS OF CONTINUOUS PROGRESS

Specify Hubbard Tools for Safe and Economical Service

New York Office
3712 Woolworth Bldg.
233 Broadway
New York (7), N. Y.

HUBBARD and COMPANY
Tool Division
Manufacturers of Quality Railroad Track Tools, Alloy Spring Washers, and Rail Anchors
6301 Butler Street
Pittsburgh (1), Pennsylvania

Chicago Office
Room 924
332 S. Michigan Ave.
Chicago (4), Ill.



HERE IS THE *Kershaw*

Developed
Proven on

(1) *Kershaw* Utility Derrick

Lightweight, 2,000 lb. capacity utility derrick that enables two men to remove cribbing machines, adzers, spike pullers and similar equipment from the track with speed and ease. Also used by small bridge gangs. Welded steel construction throughout, mounted on double flange steel rollers. Geared hand hoist with safety lock and ¼" steel cable. Positive, easy-action rail clamps, hand operated.

(2) *Kershaw* Ballast Regulator and Track Dresser

Developed to save time and money for a track-work contractor in regulating ballast, shaping ballast, and dressing track. With the plow and distributor it will save at least $400 per mile on any reballasting or resurfacing job. Available with or without power unit . . . Can be pulled by any heavy-duty 4-wheel-drive motor car. Reduces dressing gangs to approximately five men—eliminates ballast dumps and dollies entirely!

(3) *Kershaw* Ballast Plow and Distributor

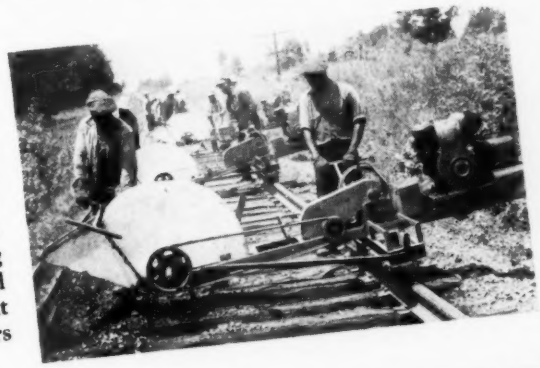
For cost- and time-saving removal of excess ballast, ballast regulation ahead of surfacing, and pulling in or plowing out ballast between rails. Double blades permit operation in both directions: one way pulls ballast in and distributes it evenly; opposite direction takes ballast out from between rails. Reduces surfacing gangs 6 to 8 men. Pulled by any heavy-duty, 4-wheel-drive motor car. Can be set off track by two men.

EXTRA GANG

on the Job . . . Hundreds of Trackwork Miles

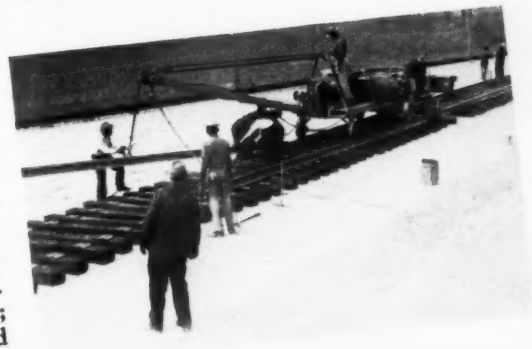
(4) *Kershaw* Spike Setter Carriage

Two spike-setters with Kershaw Spike Setter Carriages, working behind the gauging crew can set spikes for air or mechanical hammers at the rate of one 39-foot rail every minute! Carriage weighs only 65 lbs. empty, holds 1½ kegs of spikes. Saves the time of four men formerly needed to distribute spikes, and effectively prevents loss of spikes along the right-of-way.



(5) *Kershaw* Single-Wheel Kribber

Kershaw Kribbers do four important trackwork jobs that mean savings of 50% or more over hand cribbing methods: on relaying, Kershaw Kribbers remove ballast between ties and sweep ties clean ahead of adzers; on stripping while relaying, completely remove ballast between ties; on stripping with rails in place, remove ballast at tie ends and between rails right up to the rails; on cleaning out ends ahead of ballast cleaners, Kershaw Kribbers make certain a clean, efficient job.



(6) *Kershaw* Mocar Crane

Kershaw Mocar Cranes are used on flat cars for loading and unloading rail, frogs, scrap, pipe and bridge timbers; and with a standard motor car as a propelling unit for relaying track. Two Mocar Cranes (one with power unit) cost less than 40% the price of one full-revolving crane—and permit use of two cranes on the job at once. 2,200 lbs. capacity at 22-foot radius; single-drum hoist; gasoline engine; steel wheels on 2-inch axles; and pivot connections for motor car mounting.

THE KERSHAW CO., INC.
P. O. BOX 510, MONTGOMERY, ALA.

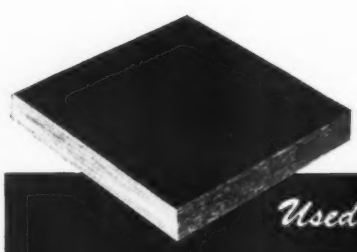
FABREEKA *Mountings for 900-*

VIADUCT OVER WEST FORK
on Chesapeake & Ohio Railway

FABREEKA Pads beneath the steel columns adjust themselves to the bearing surfaces of the concrete foundations, insure even distribution of the load, and eliminate grouting.

The Viaduct over West Fork is 176 feet high and 850 feet long. Viaduct over Arnold Fork is about the same height and 701 feet long. Towers, consisting of four supports 50 feet apart, are spaced at 100 foot intervals beneath the span.

Fabreeka Pads, 41" x 41" x 1/2", are installed beneath the 4 inch steel pedestal bases to separate and

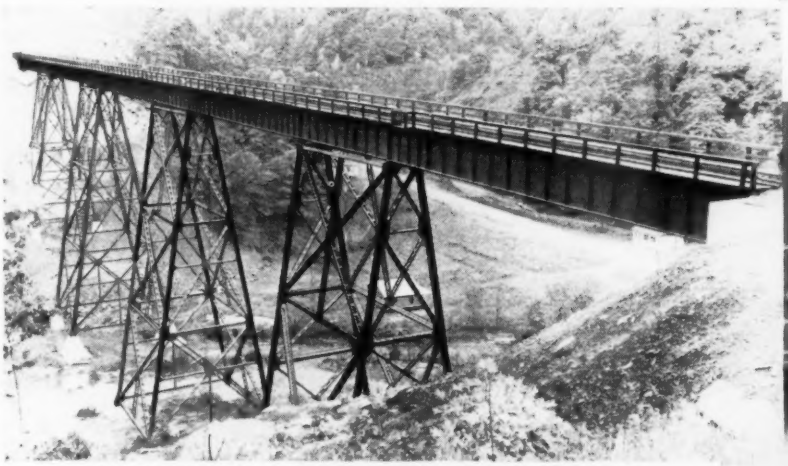


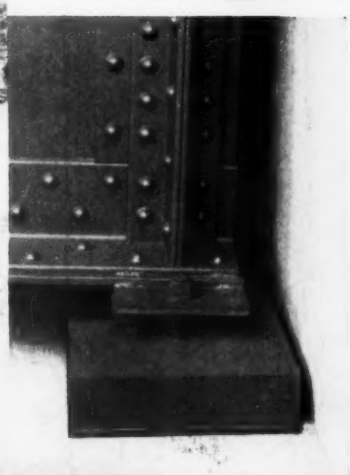
Used in **RAILWAY PASSENGER CARS, Trucks and Platforms . . . TRACK CONSTRUCTION, on Bridges, Crossings,**

ton TWIN VIADUCTS

on the C&O Ry.

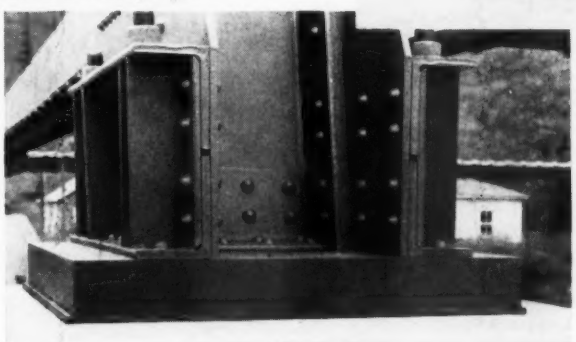
C AND O





VIADUCT OVER ARNOLD FORK
both Viaducts located in Kite, Ky.

FABREEKA Bridge Pads absorb impact shock and vibration and prevent flaking and cracking of the concrete foundations.



equalize the bearing surfaces of concrete and steel, and to seal out weather. The abutments are equipped in the same way, but with smaller FABREEKA Pads measuring 19" x 39" x ½".

Fabreeka Bridge Pads are an essential part of modern bridge construction because of their proved accomplishments and long life.

It Pays To Specify Fabreeka

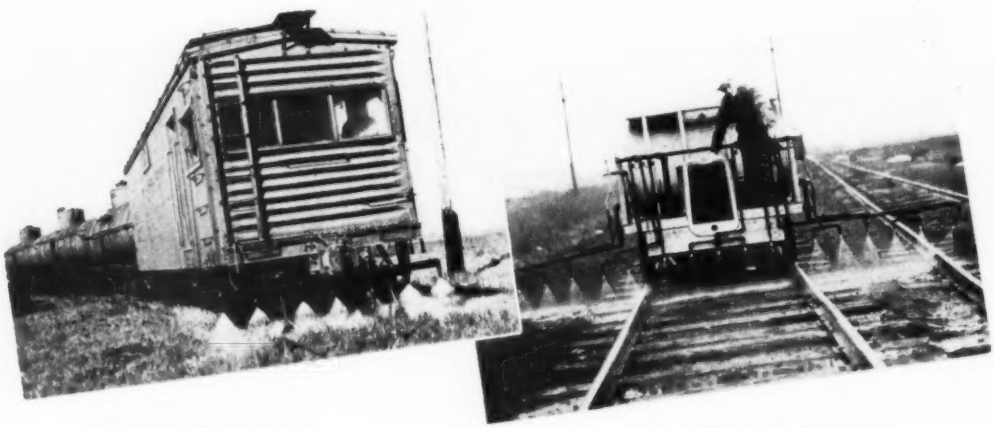
FABREEKA PRODUCTS COMPANY, INCORPORATED
222M SUMMER STREET
BOSTON 10, MASS.

LOCOMOTIVES, Steam and Diesel Electric
Curves, Turntables and Track Scales.

CHIPMAN WEED KILLERS

Do the Job!

CHIPMAN CHEMICAL COMPANY weed killers are backed by thorough experience in weed control... developed over 35 years' service to railroads. This "know how" plus strategic plant locations throughout the country enables us to offer you a complete and convenient weed control service... as well as proven chemicals.



Chipman Spray Train *Push Car Sprayer*

Our complete spray trains are available for contract service... where treatment covers extensive mileage. For restricted mileage, a small push car sprayer (usually made by the railroad) is equally practical.

In either case, Chipman proven weed killers combined with proper equipment make for successful weed control. Call on us for advice on both.

CHIPMAN CHEMICAL COMPANY, INC.

Chicago, Ill. **BOUND BROOK, N. J.** Palo Alto, Calif.

Portland, Ore. Houston, Tex. No. Kansas City, Mo.

Manufacturers of

ATLACIDE • ATLAS "A" • CHLOREX • CHIPMAN 2, 4-D

BUY STEEL TAPES WITH EASY TO READ MARKINGS THAT ARE DURABLE

Jungle dampness . . . immersion in sea water . . . chemical fumes—these and many more rugged war time tests have proven Lufkin Chrome Clad to be an outstanding development in measuring tapes.

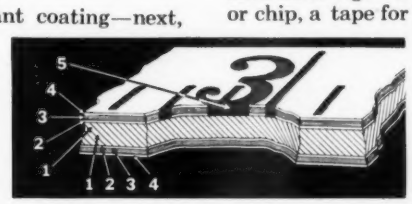
The illustrations below show why they are the first steel tapes with both durable and easy to read markings, features every tape user will welcome. The hardened steel base is of remarkable toughness and flexibility.

Over this goes a rust resistant coating—next, multiple coats of electroplating—and then a heavy chrome plating with a non-glare satin finish. Against this light-absorbing surface the jet black markings stand out sharply, easy to read in bright or poor light.

And notice how the markings are bonded to the steel base—sunk below the chrome surface to protect them even against concrete or gravel wear. If you want a tape with durable, easy to read markings—a tape that will not crack, peel or chip, a tape for tough usage—ask your dealer for Lufkin Chrome Clad.

KINKS RARELY BREAK THEM

A tough flexible "kink-resistant" steel protects against line breakage, and saves time as well as repair expense.



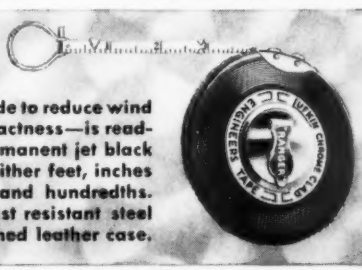
DIAGRAMMATIC CROSS-SECTION VIEW

1. Hardened Steel Tape. 2. Rust Resistant Coating. 3. Multiple Coats of Electroplating. 4. Hard, Smooth, Non-Glare Chrome-Plating. 5. Black Markings Bonded to Steel, Sunk Below Surface.

EASY TO READ IN ANY LIGHT

Durable, easy to read markings stand out sharply against the non-glare, chrome surface, even after years of tough usage.

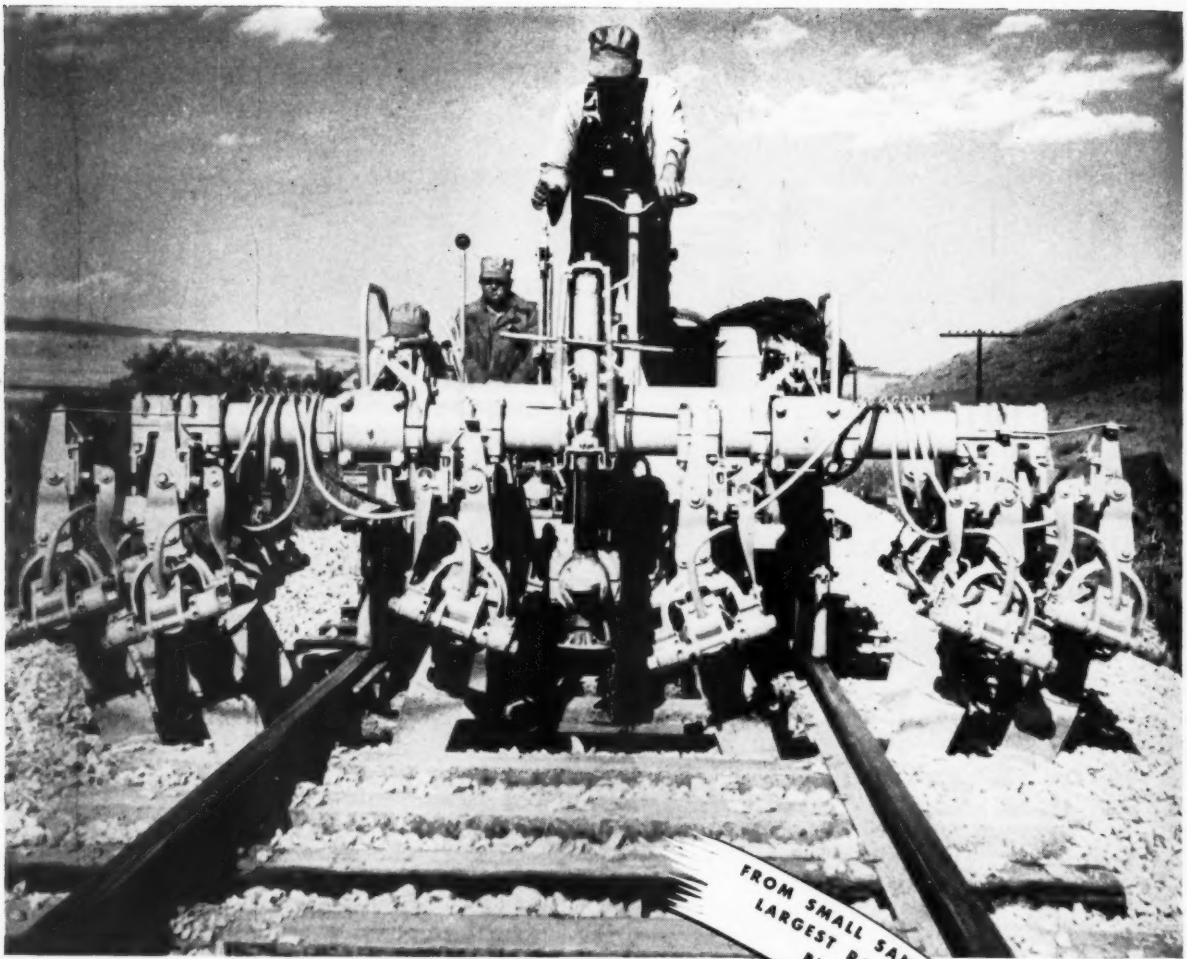
"RANGER" Model... Lufkin's Chrome Clad tape specially designed for engineers. The sturdy steel line—only ¼" wide to reduce wind resistance and provide compactness—is readily detachable from case. Permanent jet black markings are available in either feet, inches and eighths or feet, tenths and hundredths. Zero falls at end of line. Rust resistant steel liner protected by hand stitched leather case.



Buy LUFKIN

PRECISION TOOLS • TAPES • RULES
FROM YOUR DISTRIBUTOR

THE LUFKIN RULE COMPANY
Saginaw, Michigan • New York City • Windsor, Canada



FROM SMALL SANDY GRAVEL TO THE LARGEST ROCK NORMALLY USED BY ANY RAILROAD

IN ANY BALLAST

THE JACKSON MULTIPLE TAMPER

PERFORMS WITH AMAMING EFFICIENCY

In ANY ballast, large, small, medium or mixed, the JACKSON Multiple Tamper puts up perfect track in just ONE operation — with just ONE tamper operator instead of 12. Absolute uniformity of tamping is easily attained, no follow-up or smoothing operation is required, and a degree of permanence is achieved which only the vibratory action of Jackson tampers can supply. These are FACTS which JACKSON "MT's" have firmly established in putting up hundreds of miles of track — track that has stayed "put."

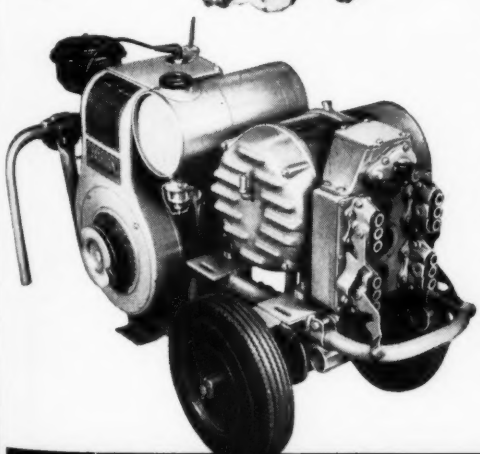
Working in tandem, two of these machines will usually double the daily footage without materially increasing the gang ahead of the machine.

ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Mich.

JACKSON VIBRATORY TAMPERS

FOR 26 YEARS THE KEY TO BETTER TRACK AND LOWER MAINTENANCE COST

* THE 4-TAMPER OUTFIT OFFERS EXCEPTIONAL FLEXIBILITY OF USAGE



Time has an inexorable way of either proving or disproving the worthiness of any equipment. It is highly significant, therefore, that after 26 years, Jackson Vibratory Tamping Equipment is preferred by the vast majority of America's leading roads. Improved in line with progress, and augmented to cover every phase of tamping to best advantage, Jackson Tamping Equipment, today, more than ever, offers you the outstanding means of putting up and maintaining better track at the very minimum of cost. Drop us a line for complete information.

*

Four Jackson Tampers and our M-2 Power Plant constitute not only the ideal outfit for spotting, skeletonizing and such out-of-face surfacing as is usually done by the average section gang, but is also unmatched by any other unit tamper when grouped in extra gang service. For doing an over-all job of maintenance it is, by long odds, the best to be had.

ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Mich.

Lorain 820

magnifies savings

IN RR MAINTENANCE

BANGOR AND AROOSTOOK RAILROAD COMPANY
By purchasing this type of shovel and scrapping the old railroad type we were able naturally to lay off the 8 pit men in addition to the night watchman. The new shovel has saved us a great deal of money, paid a very good interest rate on the money invested, and is proving out entirely satisfactory.

THEW-LORAIN 50th ANNIVERSARY 1899 1949

LORAIN-820 Saves manpower in handling ballast on the BANGOR & AROOSTOOK R. R.

With an eye to overhead, the Bangor and Aroostook Railroad Company is saving real money on maintenance operations with its new 2 yd. Lorain-820 shovel which replaced the 2½ yd. railroad type.

Paragraph at the top is from a letter written by Chief Engineer W. J. Strout, magnified for easy reading, which tells the story in a nutshell.

The new, power-packed Lorain-820, with its 2-speed crawler mechanism, combining travel with nimble maneuverability, cuts digging and loading time almost in half . . . saves *plenty* in manpower.

If you would cut construction and maintenance costs in '49, get aboard the Lorain Line. Your local Thew-Lorain distributor will route complete details your way.

THE THEW SHOVEL COMPANY • LORAIN, OHIO

Thew **Lorain** ® **820**

MODERN RAILROAD MAINTENANCE

DEMANDS *MODERN* EQUIPMENT!

You need fast, rugged, easily-handled equipment to keep a right-of-way in first-class condition under today's heavy, high-speed traffic... that's why so many railroads are using Ingersoll-Rand SPOT-AIR Compressors to furnish their Air-Power.

Ingersoll-Rand SPOT-AIR

The SPOT-AIR not only saves time on the job... it also speeds-up the move. This small, gasoline-powered, air-cooled unit is the lightest, most compact section-gang compressor ever developed... two men can carry it easily, or it can be put on a section car for the longer hauls. A specially designed wheelbarrow mounting makes it possible for one man to handle both the SPOT-AIR and Air Tools.

The SPOT-AIR is ideal for use with two new Ingersoll-Rand MT-4 Tie-Tampers... and in combination with Ingersoll-Rand Impact Wrenches, Drills, Grinders, and many other Air Tools, it is just right for bridge and building, grade-crossing and signal maintenance, and numerous emergency jobs.

Engineered for economical operation and built to Ingersoll-Rand's high standards of quality, the SPOT-AIR Compressor can give you better, faster work at a real saving in time, labor, and costs.

The modern light-weight compressor for railway maintenance.

COMPRESSORS • AIR TOOLS • ROCK DRILLS
• TURBO BLOWERS • CONDENSERS •
CENTRIFUGAL PUMPS • OIL AND GAS ENGINES

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y. 223-2

Gentlemen of the A. R. E. A.,

Our Congratulations!

No man can say how great the value of your association has been to the railroads since it was founded a half century ago. Most of the technical advances in your profession have resulted from your meetings—together and in print—whereby you inspired and instructed one another. Had each of you been required to solve every one of the complex problems which arise in railway engineering work, our railroads would not now be as advanced as they are. But by profiting from each other's experience, you have accelerated engineering progress to an amazing degree.

None of you has closed the door of his mind to engineering improvement; that is proved by the present number and enthusiasm of your members. So we predict, with you, that the railroads will, in the future, reap even greater benefits from your common efforts.

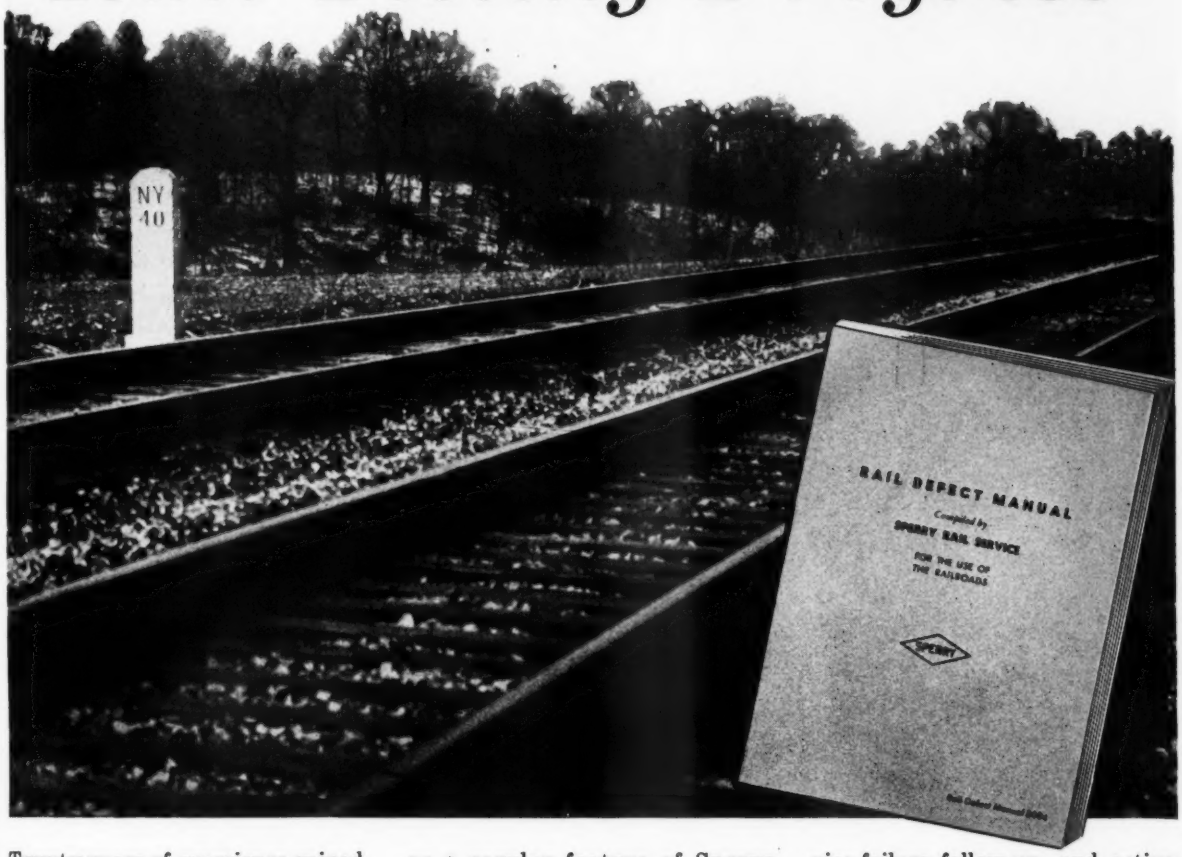
TAYLOR-COLQUITT CO. T·C TIMBER CONSERVATION

Vapor-Drying Process

TAYLOR-COLQUITT CO., SPARTANBURG, S. C.

*How Sperry Service Contributes to Railroad Safety

ANOTHER MILEPOST IN *Rail Testing Progress*



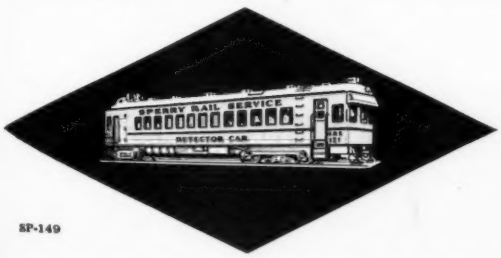
Twenty years of experience gained from testing two million miles of rail in track—data compiled from one million defects found by Sperry Detector Cars—all are contained in a brand-new handbook with a familiar title—the Fourth Edition of the Sperry *Rail Defect Manual.*

Long a standard reference of track personnel, the *Rail Defect Manual* is the only comprehensive handbook of up-to-date information on the occurrence and classification of rail defects. It is published as a regular feature of Sperry Service.

The *Rail Defect Manual* is one of many exclusive Sperry activities which go far beyond the actual locating of defects in track. These include a continuing program of research and development of new equipment, centralized quality control of each test, compilation of testing statistics, publication of the only journal devoted to rail testing — the "Sperry Review," instruction and data sheets, service-failure follow-up, and active participation in rail-breaking programs.

Each one of these activities is an important part of the Sperry testing program. Together, they contribute to the twenty-year Sperry record of finding *more* and *smaller* transverse defects, as well as more longitudinal defects than any other method of testing rail in track.

The *Rail Defect Manual* will be mailed to railroad executives upon request. Write for your copy today.



SP-149

SPERRY RAIL SERVICE

Division of Sperry Products, Inc.

DANBURY, CONN.

ANSWERS TO DRAINAGE PROBLEMS

We have stocks on hand for quick deliveries. All Young & Greenawalt Co. metal drainage products are made from internationally-known U.S.S. sheets, manufactured for us by Carnegie-Illinois Steel Corporation.

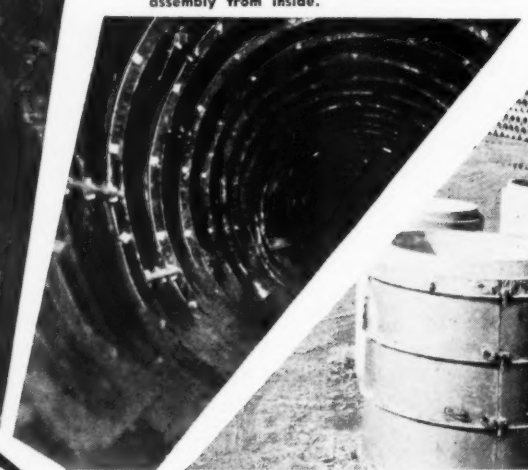
WE HAVE all the answers . . . from the materials you need when your own gang tackles the job, to the knowledge of what to do when a given problem has you stumped. The Young & Greenawalt Co. organization affords you complete consulting, engineering, and contracting facilities, seasoned by years of experience.

Investigate the economies, the products, the trouble-removing services we can furnish you.

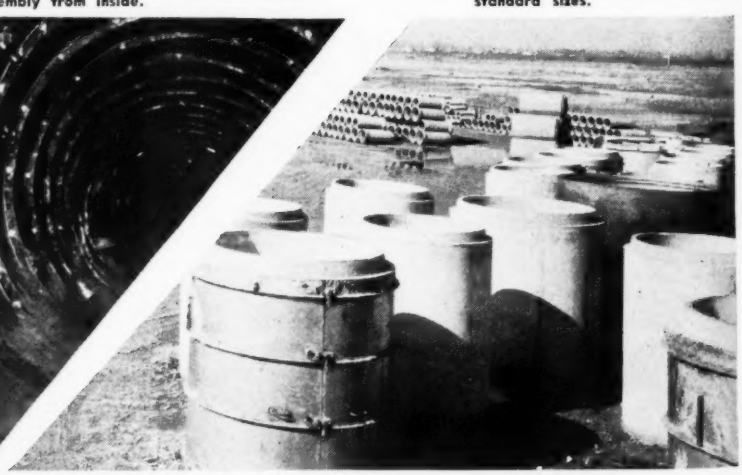
Perforated Subdrainage Pipe
Paved Invert Corrugated Metal Pipe
Liner Plates
Concrete Pipe
Concrete Battery Boxes
Mile Posts, Whistle Posts
Water Barrels and Crossing Slabs

Young & Greenawalt Co. drainage systems are proved in operation. The cost to the railroad for draining and stabilizing this 26-ft. cinder ballast fill was less than the total excess maintenance cost on it for one year.

Young & Greenawalt Co. corrugated liner plates are made in short lengths, with flanges turned in, for easy handling and assembly from inside.



Young & Greenawalt Co. concrete pipe is made to A.S.T.M. specifications, in all standard sizes.



YG Co.

YOUNG & GREENAWALT CO.

Office: 1011 E. 148th ST., EAST CHICAGO, IND. • TELEPHONE: E. CHICAGO 4099
Plants: GARY AND EAST CHICAGO, INDIANA • CHICAGO-SAGINAW 4406

One-man track team

MATCHED "CATERPILLAR" EQUIPMENT — D6 Tractor, No. 6A Angling Bulldozer and No. 60 Scraper — make low-cost work of stabilizing an old fill for the Chicago, Rock Island & Pacific Railroad. (Price of a standard D6 Tractor [74" gauge] is $7205; No. 6A Angling, cable-controlled Bulldozer, $1680; No. 60 Scraper, $4990; No. 24 single-drum Cable Control, $650; No. 23 double-drum rear-mounted Cable Control, $1200.) All prices F.O.B. Peoria and subject to change without notice.

HERE's the right equipment for right-of-way fill improvement and stabilization — a husky, hardy "Caterpillar" Diesel D6 Tractor with a No. 6A Angling 'Dozer and No. 60 Scraper. This matched "Caterpillar" one-man team does a whale of a job along the track — and does it efficiently and economically.

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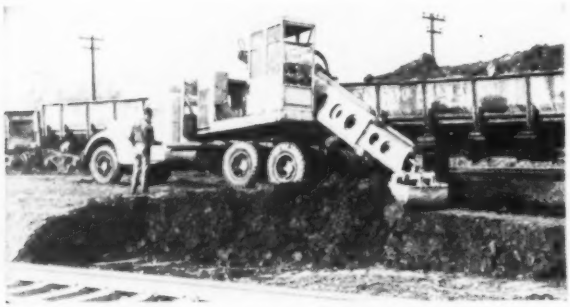

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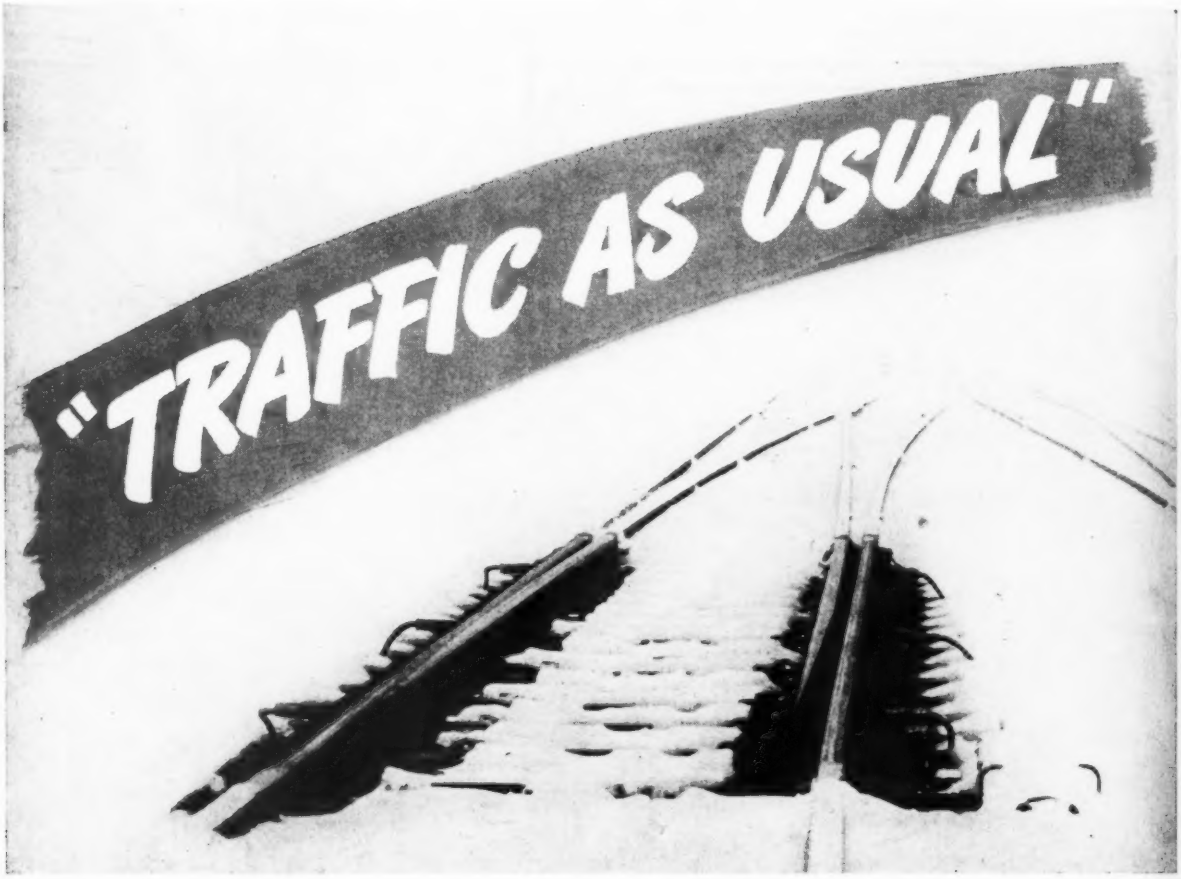

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For additional information, use postcard, pages 219-220

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No. 243 of a Series

Railway Engineering and Maintenance

SIMMONS-BOARDMAN PUBLISHING CORPORATION 105 WEST ADAMS ST. CHICAGO 3, ILL.

Subject: Own Your Own

March 1, 1949

Dear Readers:

It is gratifying to receive frequent evidence that more and more of you are becoming dissatisfied to read Maintenance from month to month on a pass-along basis, and want your own copy. In my November letter, I quoted from a note received from a division engineer who wanted to "graduate from the pass-along class".

Among other letters of this character received more recently, I quote from one from a general track foreman and one from an assistant division engineer. The former says, in part:

"It strikes me, as I think it should strike every one of your readers, that there are altogether too many maintenance-of-way men reading Maintenance on the pass-along basis—and at no cost to them. Enclosed is check for $2.00 covering one year's subscription, with the request that the publication be sent to me at my home address."

The assistant division engineer writes: "My conscience is troubling me; how can I recommend subscriptions to your magazine when I do not have a personal subscription myself? In order to rest easy, I am enclosing a money order for $3.00 to cover a subscription for a couple of years. I do not want to miss a copy."

I am pleased with such letters because, to me, here are maintenance officers, like yourselves, who are satisfied that they can get a lot more out of each issue of Maintenance if they have their own copies—to read thoroughly at their leisure, and to keep on file for future reference.

Frankly, we know that many of you, on a pass-along basis, don't get the most out of Maintenance, or anywhere near as much as you would like to—always thinking about the next man on the list. We know this because some of you have asked us why we haven't had more articles on this or that subject, when we have published many of them. Obviously, the issues containing these articles went through the hands of these men too rapidly to make a deep impression, and certainly too rapidly for them to get the most out of the articles in question.

And we like the suggestion of the general track foreman that his copies of Maintenance be addressed to him at home. More and more our readers are making such requests—not that they don't take their copies with them on the road, and maybe eventually to the office—but because they have found that at home they have the best opportunity to read each issue. And, edited to be of maximum help to you, and often containing considerable detail, it really takes some reading time to get the most from each issue.

Think it over as you read this March Equipment Economies issue. Maybe you too, if a "pass-alonger", will agree that you should have your own personal copy, and that the best place to receive it is at your home.

Sincerely,

Neal D. Howard

NDH:ag

Editor

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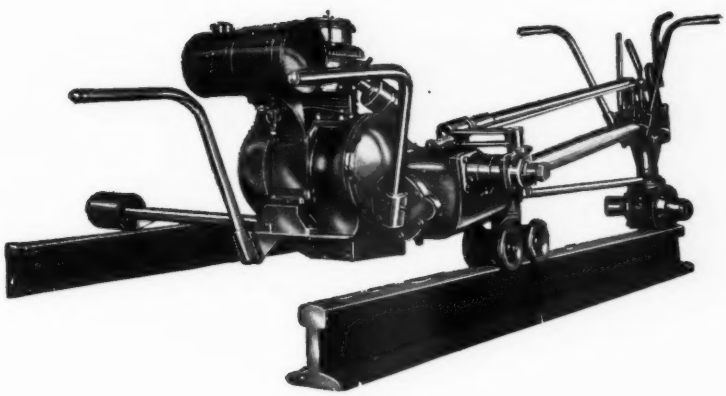

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Railway Engineering and Maintenance

NAME REGISTERED U. S. PATENT OFFICE

VOL. 45, NO. 3 MARCH, 1949

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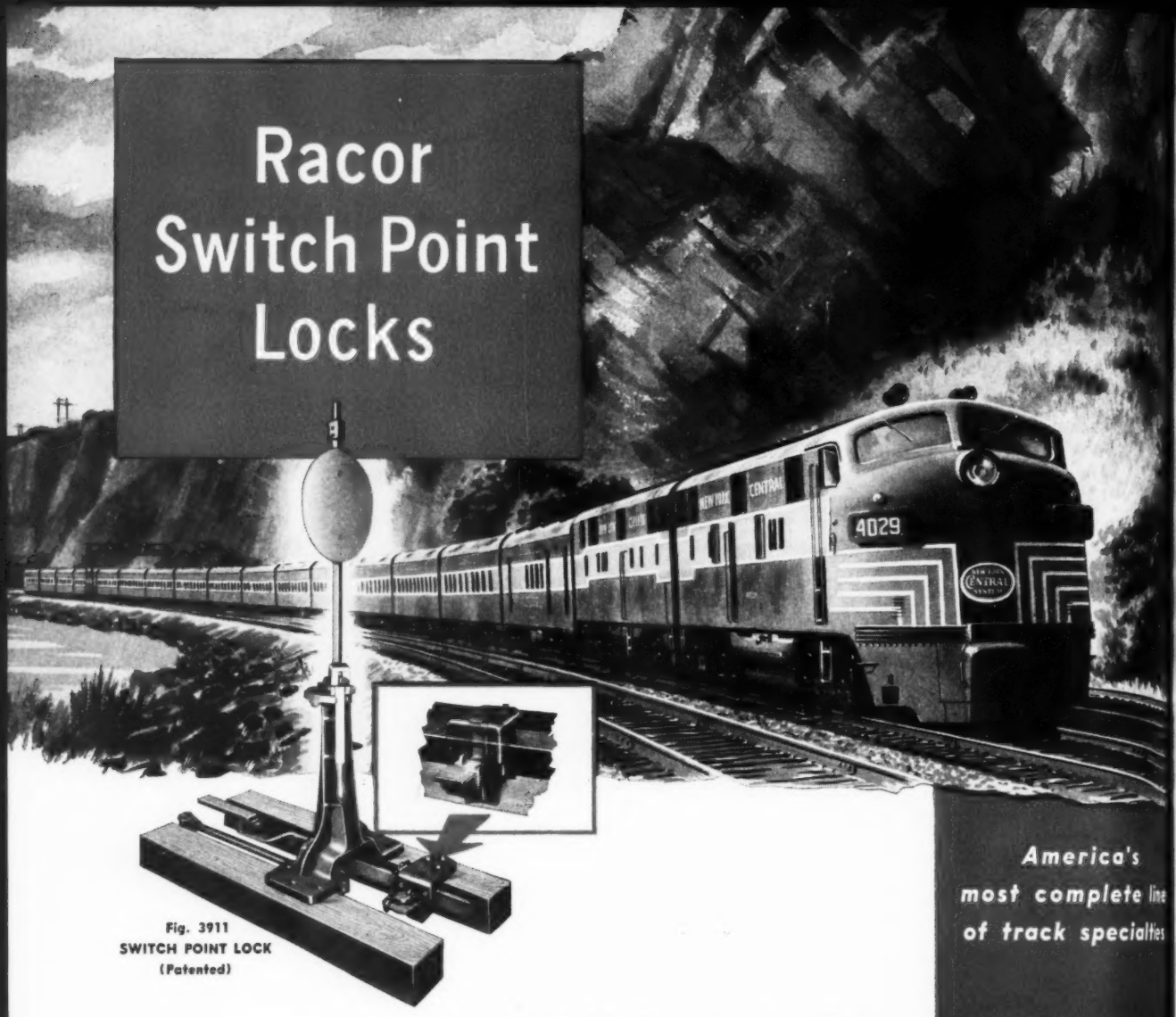

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Mechanization—

Progress—But Has It Kept Pace With Requirements?

The maintenance-of-way and structures forces have come a long way during the last generation in the mechanization of their many diversified operations; on some roads they have probably kept pace with economic demands. Many maintenance officers have long been proponents of machine methods in a constant search for means of increasing production, improving standards, and lowering unit costs, and, in some cases have been personally responsible for the design and development of specific power tools and machines. Indeed, there has been progress, but in spite of all that can be said, there are at least a few qualified critics, both within and without the railway industry, who question whether this progress has been adequate to date or is geared to meet the requirements of the future. Is there any justification for such thinking?

That mechanization has made headway in maintenance-of-way and structures operations—in types of machines and tools, and in methods and practices—is unmistakably recorded in each succeeding March Equipment Economies issue of this publication during the past many years, and that progress continues is strikingly illustrated within the pages of this current number. But that is not the real point at issue. The real point of the questioning is whether the progress made has been sufficiently broad and rapid; whether the ingenuity and initiative shown to date have been adequately bold and visionary; and whether the attitude of maintenance officers today toward mechanization is adequate to meet the demands of the future.

Such questions may seem impertinent, if not insulting, to those in the maintenance-of-way department who have long considered themselves machinery minded, but they are not intended as such, and, in all probability will cause the least offense among those who have done the most toward present mechanization. Indeed, those in this group are the most likely to accept this questioning as a challenge to future action.

To those who will view questioning in this spirit, these additional questions are raised in all seriousness. Has the mechanization of maintenance-of-way and structure operations reached desirable levels? Do present machines represent the last word in design—have they the requisites for adequate capacity and for producing the best possible results at the lowest possible unit costs? Are there machines being used at present that are rated in hundreds of units of output per day or week that should be rated in thousands or tens of thousands? Are there operations for which no fully effective mechanized means of accomplishment have been developed or applied?

These are not idle or academic questions. Confronted with a large backlog of deferred maintenance in roadway accounts, a decline in railway traffic and earnings, and higher wages and a shorter work week, on the one hand, and with the necessity for higher standards of maintenance and an ever-present need for holding costs to the minimum, on the other hand, no maintenance officer can afford to consider any such questions lightly. The five-day work week alone, compared with the six-day week now in effect, will call for a step up of 20 per cent in the rate of production, just to keep pace with present overall output. This, in itself, presents a tremendous challenge to maintenance officers and the builders of power tools and machines for maintenance work.

There are indications that some maintenance officers and equipment builders are shooting for higher goals of production and economy; that major consideration to first costs, or investment in machines, is giving way to the more important consideration of savings and other advantages per unit of investment. But few will challenge the contention that some main-

tenance officers have a long way to go in their thinking, and a still greater distance to go to the desired ultimate goal of adequate mechanization of their operations. To the extent that these contentions apply, maintenance officers, obviously, are not measuring up to their full responsibility.

Where promoting adequate mechanization calls for a difficult and persistent selling job with management, this may be the first important step in the discharge of that responsibility. But successfully selling management requires that maintenance officers first see the need clearly themselves, fully visualize the possibilities, and completely sell themselves and their forces. Until this kind of in-the-department selling has been done, they can never hope to sell management adequately and will be numbered among that group at which the finger is being pointed when the question is raised as to whether the mechanization of maintenance operations has kept pace, whether present methods are adequate, and whether maintenance men will meet the challenge of tomorrow's demands.

"GOLDEN" OPPORTUNITY—

To Acquire a Fresh Perspective

THE FIFTIETH Anniversary of the American Railway Engineering Association, to be celebrated at the annual meeting this month, is an event of deep significance, not only to members of that organization but to all railroad officers or supervisors who are responsible for the economical maintenance of railroad tracks and structures. This is so because the meeting will have the effect of focusing a spotlight on the progress that has been made in the railway engineering field during the past fifty years, and, what is more important, the problems that must be solved if comparable progress is to be achieved in future.

The goal of every maintenance man is to reduce costs without sacrifice of standards; the impending 40-hr. work week and the current decline in traffic volume are exclamation points to this statement. The development of ways and means of achieving this goal is as much a problem for the individual as it is for the A.R.E.A. Individuals can, of course, make an important contribution by working through the association, but their responsibility does not end here; to expect that the A.R.E.A. will solve all the problems is directly comparable to the attitude, so prevalent these days, that the federal government will "take care of everything." While socialistic tendencies are abroad in this country today the free enterprise system still prevails, offering rich rewards to those who serve their companies well through effort and initiative.

Attendance at the A.R.E.A. convention would be an effective method of acquiring a new and broader perspective of the problems facing maintenance men at the present time. Presented elsewhere in these pages is a complete program of the meeting, along with a statement from President C. H. Mottier, cordially inviting our readers to attend whether or not they are members of the association. A perusal of the program will be evidence enough that the activities planned for the occasion are designed to stimulate thinking along constructive lines.

Those attending this meeting will have the opportunity of viewing a record exhibit of products designed to help them achieve their goal of lower costs—the only exhibit of such products that will be seen this year. Also in this issue is a complete list of the exhibitors, including the products to be displayed, and a statement by President Max K. Ruppert, president of the sponsoring organization—The National Railway Appliances Association—inviting our readers to inspect the display.

Here indeed—in the convention and the exhibit—is a "golden" opportunity for maintenance men.

MACHINE SAVINGS—

Not Confined Entirely to Man-Hours

EQUIPMENT economies is a broad term that implies much more than merely saving money by using machine power where manual labor would otherwise be required. A clear conception of this fact is necessary to avoid lopsided thinking regarding the benefits of power-driven tools and equipment. To take the position that all machines must justify themselves on the basis of man-hour savings alone would be to ignore some considerations that, on occasion, can be of such importance as to dwarf the labor-saving feature.

Take snow-fighting equipment as an obvious example. The value of a snow plow lies primarily in its ability to clear a line quickly to permit the restoration of traffic, thereby minimizing revenue losses. In most instances the work done by a snow plow couldn't be done by hand labor anyway, at least within a reasonable period, even if sufficient labor could be hired, which is extremely questionable today.

Those machines that perform tasks that could not be done at all by hand comprise another class of equipment that need not justify itself on the basis of the labor saved. These include such units as pile-drivers, cranes and bridge derricks. Ballast-renovating equipment might also be included in this group. The cost of cleaning ballast by hand is now so great that such work on an out-of-face basis would be impracticable today in the absence of the various types of machines that have been developed for doing it. Roadbed grouting is still another operation that could not be done at all without the aid of power equipment.

Other generally-accepted advantages of machine power, not directly related to the labor-saving angle, include its ability to turn out a better grade of workmanship than can be done by hand, and the fact that it takes the drudgery out of many otherwise back-breaking tasks.

What this discussion leads up to is the thought that the advantages of power-driven equipment cannot always be calculated in dollars and cents, and that the "interest on the investment" may, and generally does, include important items other than a direct saving in labor.

Many units of tamping and surfacing equipment will be needed to complete the 1949 programs

Work Equipment Purchases May Hit New High

Present estimates of railway officers indicate that they will buy about 9,000 roadway machines and tools in 1949, at a cost of approximately $19,000,000, but they admit that potential purchases are much higher

Rail-laying equipment will be in demand during the year to lay the large tonnage of rail now on order by the railroads

• Unparalleled forces—the greatest of which is the imminence of the five-day week in the maintenance-of-way and structures departments—portend an even heavier demand for work equipment in the near future—possibly in 1949—than the high levels of recent years. Whether that demand will result in record purchases will be contingent on whether the bullish tendencies—a shorter work week, higher basic wage rates, and the continuing need for economical methods of maintenance—will be equalled by the bearish forces—increased costs of materials and decreasing volume of traffic—which affect the amount of money available for the purchase of machinery.

That the bears are asserting a negative influence, at least while the wage-and-hour question is still unsettled, is indicated by the replies received from many of the chief maintenance officers of a group of representative roads who were questioned by *Railroad Engineering and Maintenance* as to how many power machines and tools they expect to buy this year. Answers were received from officers of 39 roads. Of these, 33 officers, representing 133,266 mi. of lines, reported that they plan to purchase about 3,000 units of work equipment in 1949. The other six officers stated that although they usually purchase equipment in varying amounts, they were unprepared at this time to state how much they would buy during 1949.

One of the 33 officers reporting prospective purchases said that he was already committed to the purchase of the amount of equipment reported, but he did not indicate

what other commitments he might make during the year. Others, likewise, listed contemplated purchases, but put no limit on what the final volume of their purchases may be with changing conditions throughout the year. No road indicated equipment purchases entirely to offset shortages of labor, although 10 roads reported labor shortages a factor, and at least one chief maintenance officer said that approximately 40 per cent of his purchases would be made for that reason. On the other hand, 25 roads stated that rising labor costs were influencing the extent of their purchases—one as much as 60 per cent—and several mentioned the probability of the five-day week as an important factor.

Reflecting the feeling of most of those making reply, one chief engineer said, "We feel that it is essential that we achieve as much mechanization of our maintenance-of-way forces as is possible. Furthermore, by replacing our old and obsolete equipment we reduce our cost of maintaining it and increase the efficiency of our crews."

Estimated Purchases

On the basis of the actual number of units included in the budgets of the roads that furnished specific information, and giving consideration to volume bought in recent years, it is estimated that all the railways of the United States and Canada are planning to buy a total of about 9,000 units of equipment in 1949. This total includes both the heavier types of equipment and the more important portable, power-operated small tools which are being used in ever increasing numbers, but does not include many of the smaller appliances that are seldom reported either in budgets or in yearly purchases. This total compares with 9,300 power tools and machines purchased in 1948, as reported in the January issue. The expenditure to be made for the 9,000 units is estimated at $19,000,000, which is $300,000 more than the expenditures for similar equipment in 1948.

However, that the basic figure of 9,000 units in 1949 may be exceeded is indicated by the reply of a representative chief engineer, who said, "If labor costs continue to rise, the purchase of more equipment will undoubtedly be considered to try to offset partially such increases."

The greatest potential factor in increased labor costs lies in the probability of the five-day week in maintenance-of-way operations, which, if it comes, will bring with it the necessity of accomplishing as much work in five days as has been done heretofore in six. The necessity of accomplishing at least as much overall work as in the past is shown by the latest study of the Engineering Section of the Bureau of Valuation, Interstate Commerce Commission, released on January 19, which points out that deferred maintenance in roadway accounts of the Class I railroads, from 1942 through 1948, had accumulated to $560,000,000. This is an increase of $110,000,000 over the amount reported last year as having accumulated to the end of 1947. Obviously, deferred maintenance cannot be allowed to increase inordinately without adverse effects on operation in the future.

That the engineering officers of the railways do not intend to foster the accumulation of under-maintenance is evident in information they have furnished relative to their maintenance budgets for 1949, which indicates that 1,850,000 net tons of rail will be laid, that 43,000,000 crossties will be installed, and that 25,000 mi. of track will be surfaced out of face. This, in all cases, is slightly more than last year.

Effect of Five-day Week

To accomplish this amount of work on a shorter work week basis the railways will have to acquire, theoretically, 20 per cent more work equipment. At least, that is the way a witness for management put it in the hearing before the emergency board that was appointed by the President to investigate and report on, among other things, the proposed five-day week for non-operating employees. He said, "With the degree of mechanization with which this maintenance-of-way work is now carried on, it would be of no great benefit to put more men on the job if we were not able to give them the tools and machines with which to work. In addition to the men, therefore, it would be necessary to acquire a very considerable amount of additional machinery." He went on to state that to accomplish in five days the same amount of work that five gangs now perform in six days, one new gang would have to be organized and mechanized.

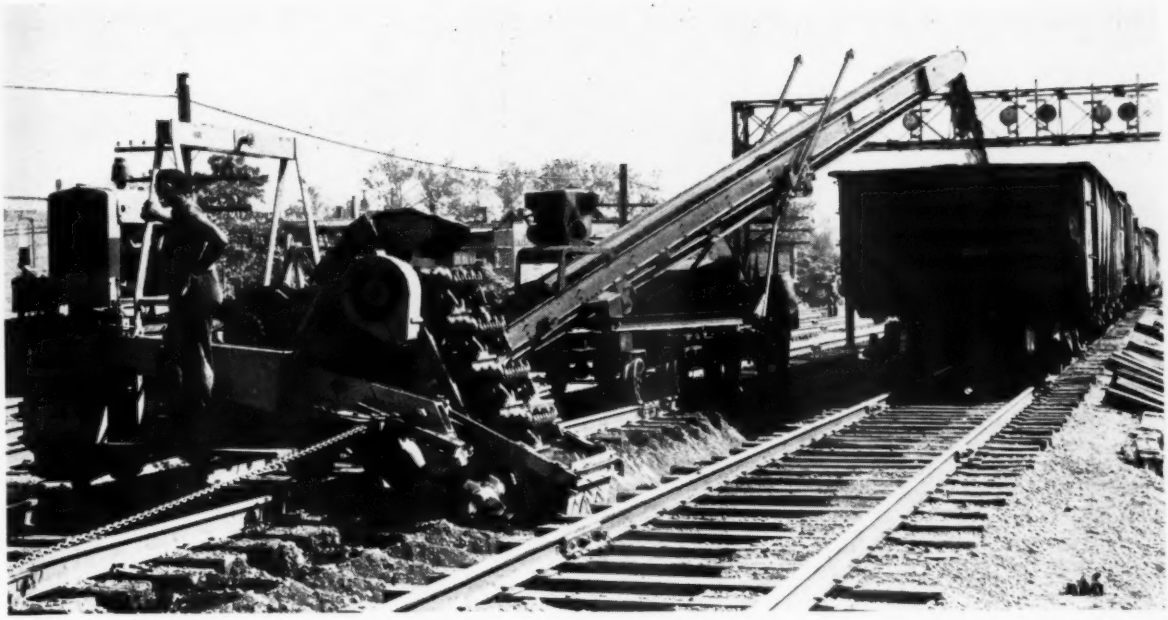
Effect on Section Gangs

Although the witness was speaking primarily of extra gangs, such as used for rail laying, track raising, and reballasting, the same analogy can be drawn for section gangs. Many railway officers have long felt that the mechanization of section gangs has lagged too far behind the parade of "shining examples" of the economy of machinery applied to extra-gang work. A few roads are, of course, exceptions to the charge of lagging in this respect. However, if and when the five-day week becomes an immediate fact rather than an imminent possibility, section gang work is sure to receive a revamping of some sort, in a serious attempt to accomplish the "never-ending" duties of the section gang in one less day per week. Whatever form this reorganization may take, power-driven equipment will surely play a major role. One responsible railway officer expressed his feeling in this matter in no uncertain terms when he said bluntly, "The tamping pick is doomed".

B. & B. Forces

Further mechanization of the bridge and building forces is no less imperative than that of the track forces. It is doubtful if a dollar, even in its present shrunken state, can purchase more effectiveness and economy for the maintenance-of-way department than when applied toward the cost of a needed power tool or machine for the bridge and building department. Although much has been done in the past toward mechanizing the B. & B. forces, they are far from saturated with power-operated tools, and, on some roads, are the least mechanized of all important forces. The prospect of further mechanization of these forces is enhanced not only by the need for accomplishing more work in a shorter period of time, but by the continuing increase in the number of new tools being developed for the various types of work done by these forces.

In summarizing the outlook for work equipment purchases in 1949, it seems improbable that such strong forces as those which are tending to bring about increased purchases can be thwarted by the spectres of lower current income and continuing high prices of materials. Nothing less than a general recession of business seems capable of decreasing the demand for work equipment. Manufacturers of such equipment have before them the opportunity of providing the means for the railways to continue their high standard of maintenance in spite of any adverse influences which may come on the scene. For accepting that opportunity they might well be rewarded with healthy railway business for many years to come.



The Ballastex and conveyors in operation, loading into a gondola. The work train was cut out to facilitate taking the photograph

Conveyors Used TO LOAD Excavated Ballast

Because of a restricted right-of-way, the Chicago, Burlington & Quincy was recently faced with the problem of economically disposing of the old ballast material when it undertook a reballasting project on a section of its line largely within the Chicago yard limits. How it solved the problem with the aid of power cribbing machines, a shoulder and inter-track ballast excavator, and a conveyor system, is told in this article.

A battery of four Cribex machines stripping ballast from westbound track

• A novel application of the familiar endless-belt conveyor—and one which may have an important bearing on the increased use of such equipment in railway work—was used recently, with notable success, on the Chicago, Burlington & Quincy, when that road began a crib-cleaning, reballasting and resurfacing project on a seven-mile stretch of its multiple-track main line, largely within its Chicago yard limits. Here, where the right-of-way is elevated and, for the most part, severely restricted in width, it was not possible to waste the old ballast material along the track as is often the case in more open country, and it was necessary to load all of the material for shipment to other disposal points.

A highly satisfactory solution to the problem presented was found in the use of a 35-ft. Barber-Greene belt-type conveyor, which was mounted on a push car in such manner that it could discharge material into gondola cars on an adjacent track. This conveyor was fed by a 20-ft. Nordberg conveyor which, in turn, was fed by a Nordberg ballast-excavating machine, known as the Ballastex.

This combination of equipment proved to be capable of loading an average of seven 65-ton cars of old ballast during a working day, representing as much as ¾ mi. of travel for the equipment. On some days as many as 15 cars were loaded, the fastest loading time being 12 min. per car.

The track involved in this project extends from Mile Post 2, near Halsted Street station, Chicago, to Mile Post 9, near the La Vergne Station, Berwyn, Ill. Between these points are stretches of three and four main tracks, with running tracks and industrial sidings directly adjacent to the main tracks. The tracks are largely on fill and, in

many locations, the fill is held in position by retaining walls which are constructed on the property line, with only a narrow walkway between the outside tracks and the walls. At other locations, where the tracks are not on fill, the adjoining property is only a short distance from the outside tracks.

Traffic over this section of track is heavy and includes 71 suburban trains, 32 regular through passenger trains and numerous freight-delivery and inter-change runs daily.

The last general reballasting done at this location was performed about 20 years ago, and during the intervening period the ballast—largely pit-run gravel—had become badly fouled. But for the fact that the tracks involved carry relatively little freight traffic, reballasting would have been necessary at a much earlier date. When it was decided to reballast this section, it was also decided to change from gravel ballast to blast-furnace slag, thus making it desirable to remove as much of the old material as possible from the tracks.

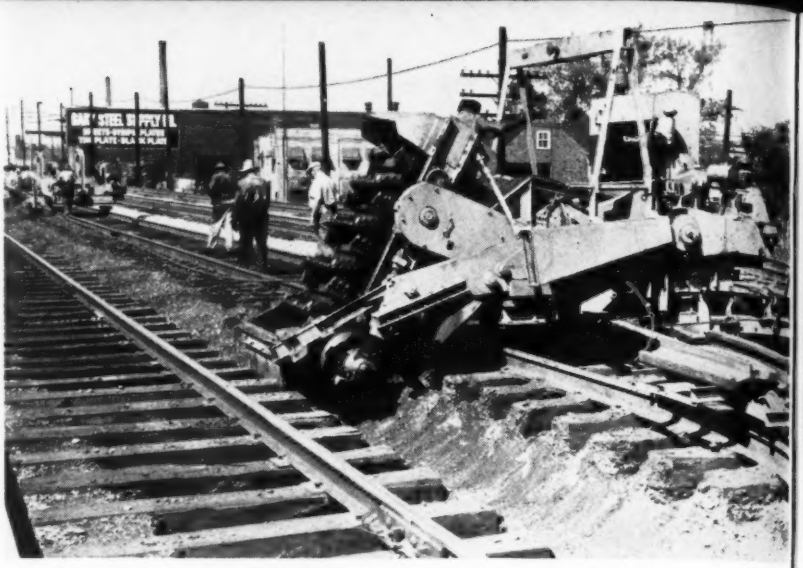
For removing the old ballast from the cribs, the road leased four Nordberg Cribex machines from the manufacturer. This type machine, as is now generally known, is a track-mounted unit, capable of removing ballast from the tie cribs and depositing it in the inter-track space or on the ballast shoulder.

Less familiar, perhaps, is the Ballastex. This, too, is a track-mounted unit, but its function is to excavate the ballast from the inter-track space or shoulder for disposal or cleaning. The machine is equipped with a downward-projecting hydraulically-operated double-arm on one side, with two cone-shaped cutting and collecting drums mounted horizontally at its lower end in such a way that they can operate in the ballast section along the side of the track. A number of lugs are welded to the surfaces of the cones.

The boom is arranged to raise and lower with respect to the track, and the cones are mounted so that one is in advance of the boom and the other is behind it, the small ends of the cones being pointed away from the machine, in line with the track. An endless-chain mechanism, with a series of digging buckets attached, is mounted between the arms of the boom in such a manner that the buckets enter the shoulder or inter-track ballast between the cones.

Movement of the machine is accomplished by means of two 100-ft. lengths of chain which, at the start of the day's work, are joined together and attached to a track rail ahead of the unit by a wedged clamp. The free end of the chain is passed over a pulley on the machine, driven by a hydraulic motor, which reels in the chain and, in consequence, pulls the entire unit along the track. As soon as the first length of chain has been reeled in, it is detached and moved ahead. The speed of the machine when in use is 600 ft. to 900 ft. per hour, depending on the depth of cut.

The Ballastex is arranged for use in either direction along the track, for which purpose the two digging cones are provided.



The Ballastex making its second pass along a track. Note the Cribex units directly ahead depositing crib ballast in the trough left by the earlier pass of the Ballastex

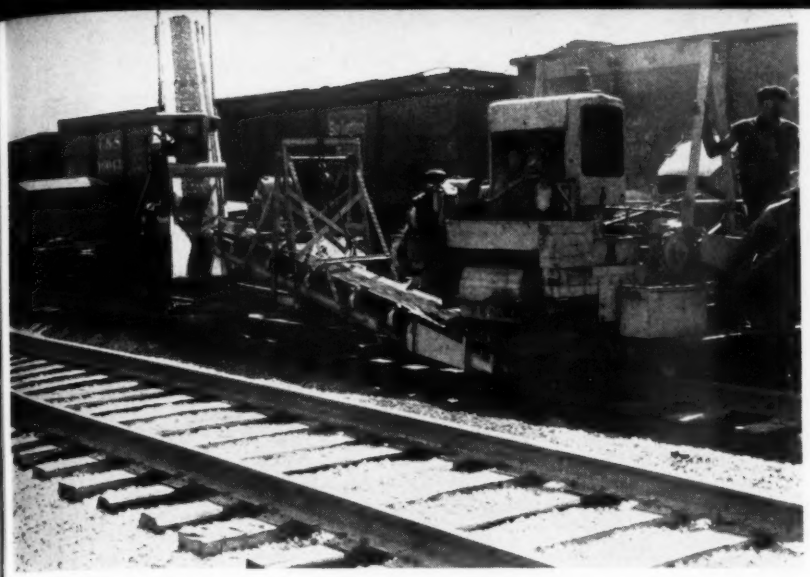
Operation

When in operation, the boom is lowered until the digging mechanism rests on the surface of the ballast. This mechanism is then set in motion and settles, by its own weight, to the depth of excavation desired. The travel gear is then started and, as the machine moves ahead, the forward drum loosens the ballast, which is then picked up by the buckets on the endless-chain and is deposited, within the machine, on a lateral endless-belt conveyor. The conveyor may be adjusted to dispose of the excavated material laterally up to seven feet from the ends of the ties on the opposite side of the track from the digging mechanism. However, because of the restrictive conditions already mentioned, the Burlington operated the Ballastex with this conveyor fully retracted, and discharging on the receiving end of the initial conveyor of the two units that were employed for loading the material into cars.

The first of the loading conveyors was a 20-ft. unit that had been designed by Nordberg for use with the Ballastex. Mounted on a special four-wheel dolly car, which was coupled close to the Ballastex, this unit received the dirty ballast from the fully-retracted internal conveyor on the Ballastex and carried it to the rear to deposit it on the final conveyor which performed the actual loading into work-train cars.

The second of the loading conveyors was a 35-ft. Barber-Greene, Model 363 stockpiler-loader, of the type frequently seen in coal yards and similar locations, and normally mounted on two pneumatic-tired wheels. For the reballasting project, the wheel mounting was removed and the conveyor, together with its power plant, was supported on a special base mounted on an ordinary push car. The base, made in the railroad's shops, provided a means of moving the conveyor laterally on the car and also for pivoting it, as necessary. The push car was coupled to the special dolly car on which the 20-ft. Nordberg conveyor was mounted. Thus all units of the equipment were pulled along the same track by the propelling mechanism of the Ballastex.

When in operation, the long conveyor was positioned by adjusting the special base so as to place the lower, or receiving, end directly under the discharge end of the smaller conveyor. At the same time the upper end was placed so that the excavated material would fall in the approximate center, laterally, of a high-side gondola car on an adjacent track. An operator and two helpers were employed on the Ballastex, while one operator was



The arrangement of equipment is clearly seen in this view, which shows the Ballastex, the intermediate conveyor, and the final conveyor which performed the actual loading

assigned to handle the two conveyors.

Two passes of the Ballastex and conveyors were required through each inter-track or shoulder space involved. On the first pass the Ballastex excavated the existing ballast to a depth of 19 in. below the tops of the ties, cutting a trench 42 in. wide at the top, while the conveyors loaded the old material. The four Cribex units followed directly behind, removing the crib ballast from half of one track and depositing it in the trough left by the Ballastex. The Cribex machines then made a pass along the adjacent track, cleaning out the half-cribs of that track adjacent to the trough. The final pass of the Ballastex and conveyors removed all of the cribbed material from the inter-track space or shoulder and loaded it.

A work train, made up entirely of high-side gondolas, was operated daily in conjunction with the Ballastex. At the start of work, the train was spotted so that the long conveyor discharged into the advance end of the end car in the train. The train remained standing while the machines moved ahead the length of the car. Then, without requiring the Ballastex or the conveyors to stop operations, the train was moved ahead a car length so that the conveyor again discharged into the advance end of the car. This process was repeated until the end car was fully loaded, after which the next car in the train was loaded in the same manner.

The arrangement of equipment described above fouled only two tracks—the track on which the excavating and conveying equipment was operated and the track used by the work train. Thus, trains moving on other adjacent tracks were not interrupted, but they were notified by order to reduce to 20 m.p.h. while passing the work.

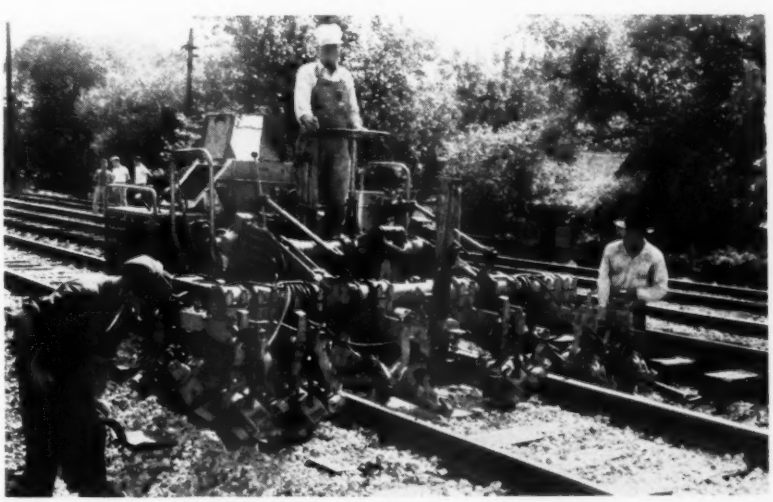
As the track was being fully skeletonized, a tie-renewal force of 45 men moved in to carry out their phase of the work. Aided by the absence of crib, inter-track and shoulder ballast, this force moved rapidly. As soon as tie renewals were completed, blast-furnace slag ballast was unloaded in preparation for track raising.

The track was raised an average of three inches, as indicated by grade stakes set at 100-ft. intervals. A Nordberg hydraulic power jack was used to make the raise. The track between the stakes was carried by eye, using a spot board. The men employed in the raising work were organized into several small gangs, some fork-tamping the ties at the points raised by the power jacks, others throwing in ballast to fill the cribs, while still others levelled ballast, and lined the tracks.

Tamping was performed by a Jackson Multiple Tamper. This unit is a track-mounted machine with 12 electric vibratory tampers arranged on a crosshead which is raised and lowered hydraulically. The mounting of the individual tampers is such that, when lowered into the ballast, they tamp both sides of a tie simultaneously, including the ballast under the rails. Production of this unit was high and averaged 500 ft. per hour when operating.

As mentioned earlier, there is a heavy suburban traffic on this line, most of which is concentrated in morning and afternoon rushes. This, coupled with a number of through trains with morning arrivals, prevented the track forces from having the use of the track until 10 a.m. Similarly, the afternoon rush required them to release the track by 4 p.m. Thus, only a maximum of six hour's working time was available, including the lunch period, but during this time the track forces had exclusive use of the tracks.

This project and the development of the special equipment employed was carried out under the general direction of H. R. Clarke, chief engineer, Burlington Lines, and E. J. Brown, engineer of track, Chicago. S. E. Tracy, superintendent of work equipment, Chicago, collaborated with engineers of the Nordberg Manufacturing Company in adapting the equipment for use on the project. R. P. Johns, roadmaster, was in direct charge of the work.



Tamping of the raise was performed by this Jackson Multiple Tamper

Wedge plows did yeoman service in opening up drifts in many areas. Above, such a plow on the North Western hits a big drift, throwing the snow as much as 60 ft. Insert shows use of portable telephones to keep headquarters informed of conditions

Snow-Fighting Equipment

All available units are thrown against the record-breaking western blizzards during January and February as the roads struggle to keep their lines open. Some ingenious methods of attack developed

Another view of a wedge plow on the North Western, mounted on a heavily-loaded gondola, pushed by two freight locomotives, tank to tank. When hitting big drifts, least trouble was encountered if plow was withdrawn just before it completely stalled

• Railroad men in the territory west and northwest of Omaha, Neb., will long remember the blizzards and snow-fighting operations of the winter of 1948-1949, because, generally, the lines in this territory encountered the most severe snow conditions on record, and their forces, aided by the greatest array of snow-fighting equipment ever amassed in the area, fought storms almost continuously from January 1 to past the middle of February. In some sections one storm followed closely upon another, and when precipitation let up, winds of high velocity caused "ground blizzards", which undid much or all of the work which the railroads had accomplished in opening their lines.

When the seriousness of the situation became evident, all available equipment and necessary personnel were marshalled in the area, the equipment including rotary plows, wing plows, wedge plows, Jordan spreaders and spreader - ditchers, flangers, bulldozers, and both on and off-track cranes and draglines. Much of the equipment used was already in the territory involved, but this was augmented by equipment brought in from other divisions, and borrowed from other roads, and by a large number of crawler units—especially bulldozers—rented from

Both on and off-track cranes and draglines were used, where available, for breaking down snow walls and widening snow cuts

Jordan spreaders proved indispensable in widening snow cuts and in cutting snow ditches. This view was taken on the Burlington

ent Gets Toughest Workout

contractors or secured from the army which was conducting "Operation Snowbound" in the area to open highways and reach isolated towns and settlements.

According to first-hand reports, the various types of plows and the spreaders carried the brunt of the work—with bucking and yard-gaining honors going to the wedge plows in many cases, backed up by one or two heavy freight locomotives. When bucking cut drifts with the wedge plow, one group found it particularly advantageous to have its locomotives tank to tank, so that the rear engine would be all set to pull the plow back into the clear just before it stalled and became clogged with cave-in snow.

Jordan spreaders were particularly effective in widening cuts made by the plows and in clearing out opened cuts; also in cutting snow ditches to accommodate water when the snow melts. Bulldozers—and the largest types were found most effective—were used to shave back snow cut walls, working from the track; to break down the snow walls, working from above; and to doze out cuts both lengthwise and sidewise. Cranes and draglines were also used to widen snow cuts, working from the track or banks as seemed most advantageous. In one instance a two-yard clamshell bucket was used effectively as a ram to break down snow walls, the bucket being dropped repeatedly along the top of the cut face. The snow forced into the track area was then cleared out by a Jordan, plow or bulldozer.

Right—A rotary working through a shallow drift in Nebraska. Below—One of the army of bulldozers that was thrown into the battle to widen and clear snow cuts. Big units proved most valuable

This article, which is adapted from an address made by the author before a recent meeting of the Metropolitan Maintenance of Way Club at New York, tells of studies made by the Pennsylvania to determine the economy of employing power tools and machines in maintenance-of-way and structures work. These studies, which covered 25 different types of equipment, showed, among other things, that for every $1,000 invested in the machines under consideration, there resulted an average saving of 3,560 man-hours of labor per year.

Studies Show Machine E

By J. M. FOX

Assistant to Chief Engineer, Eastern Region, Pennsylvania, Philadelphia, Pa.

• Great strides have already been made in the development and use of power tools and machines for maintenance-of-way and structures work, but further strides can still be made in this field. The use of such equipment results in a tremendous saving in man-hours actually worked. This is true even though a very conservative estimate is made of the capabilities of the various machines.

To determine the savings now being realized by the use of machines in maintenance work, our road made a study of 25 different types. These included power rail and bonding drills, a power rail saw, and a power track wrench; a spike puller; tie adzers; pneumatic spike drivers; oxyacetylene cutting outfits; various types of cranes; several types of tie-tamping equipment; the power jack; a couple of types of ballast cleaners; earth boring machines; paving breakers; a paint spray outfit; a power chain saw; a concrete mixer; and a Pumpcrete machine. This study was conducted by the writer with the assistance of two practical division engineers, a practical supervisor of track, an old-time master carpenter, and a supervisor of signals—each of whom knew his business.

Machines Selected for Study

The machines selected for study were chosen because, in each case it was possible to make a close estimate of the labor savings—man-hours—resulting from their use. The cost of each machine was known and the gross capital outlay for all of the machines was thus easily determined. By dividing the total savings in man-hours by the total capital outlay, it was found that for every $1,000 expended for the machines embraced in the study, there resulted a saving of 3,560 man-hours of labor per year. This saving in man-hours represented only those men employed in Group III of the Interstate Commerce Commission classification, or maintenance-of-way and structures employees. The 3,560 man-hours saving, if converted to dollars, would be the gross saving, which would be reduced to some extent, of course, by the cost of repairs to the equipment and interest on the investment.

Examples Cited

To indicate how this saving in man-hours per $1,000 invested was determined, I cite the following examples.

We have a number of power rail drills, the average cost of which, at the time of the study, was $577 each. We estimated that a power drill would work continuously only 75 days during the year, and also that it would drill 60 holes a day, or 4,500 holes during the working season. A force of one operator and one watchman would be required in the operation. On the other hand, we estimated that if this work was done with a hand drill, two drills would be required, employing five men—one acting as watchman—to accomplish the same amount of work in the same length of time.

Savings from Power Drills

It is readily evident that the power drill thus saves three men daily. At eight hours per day per man for 75 days, this amounts to 1800 man-hours per year. Dividing 1800 by $0.577 (the cost of the machine in terms of thousands of dollars), we get a gross saving for this particular machine of approximately 3,120 man-hours per year per $1,000 of capital outlay.

The estimated work period of 75 days, and the estimate that two hand drills would be required to keep up

Results of this study show that use of a Pumpcrete machine in placing concrete as compared with hand labor saves about 3,220 man-hours per year per $1,000 invested

Economies

with one power drill are, obviously, highly conservative. Actually, such machines should work more than 75 days per year and should be able to keep ahead of about four hand drills without difficulty.

Savings from Pumpcrete Unit

Another machine included in our study, as indicated earlier, was the Pumpcrete machine—which is used to deliver concrete to the forms and thus replace hand labor in carting it. On the type of work considered in our study, we estimated that 29 men would be required for the hand operation, whereas only seven men were needed with the machine. In this case the working period was considered as 100 days, and the gross saving in man-hours was found to be 17,600 per year. As the machine cost $5,471 at the time of purchase, the saving per year per $1,000 invested was approximately 3,220 man-hours. The results of our study with respect to four other types of machines—spike pullers, tie adzers, air spike drivers and the power jack—are shown in the accompanying tabulation. As mentioned earlier, the average saving for all the machines considered was 3,560 man-hours per year per $1,000 of investment.

Must Follow Up Operations

It would be entirely wrong to convey the impression that labor can be practically eliminated by the use of machinery. Actually, as the number of machines of various types is increased, a point of diminishing returns will be reached. But there is some point where a certain number of machines, worked to their maximum capacity, will result in maximum economy.

On a small railroad, the higher maintenance officers can easily keep a record of the machines in service, the work performed daily by each machine, the time that any machine is in the shop for repairs, etc. But it is doubtful if this can be done efficiently at any central point on large roads because of the great amount of paper work and the delay that would be involved if the proper officer scanned each report carefully and criticized the performance when not up to par.

Such records mean nothing unless the proper supervisory officer knows at once when a machine is down for repairs, and when it will again be available. Likewise, he must know when work is done without a machine when one is available. These and other intimate details, such as the daily performance of the machine, are only in the hands of the roadmaster, the master carpenter, the supervisor of telegraph and signals, or possibly the division engineer.

Therefore, if the railroads are to realize the maximum savings which the capital outlay for power equipment warrants, it is imperative that the men in direct supervision of the track, bridge and building, and telegraph and signal forces become machinery minded. These men should be vitally interested in labor-saving devices because their jobs depend upon keeping their particular sections of railroad property up to standard with the force and materials allotted to them.

Other Factors

Generally speaking, we have found that the men prefer to use machinery when it is available, rather than to perform the arduous hand labor

Examples of Man-Hour Savings per Year per $1,000 Invested for Various Types of Roadway Machines

Spike Pulling Machine

Working period—200 days per year.
Pulling spikes in connection with rail renewals or out-of-face gaging
Day's production—150 rail lengths (39-ft. rails) or 13,200 spikes pulled

MACHINE OPERATION	HAND OPERATION
(1 machine)	
4 laborers	11 laborers

Saving in force—7 laborers
Labor saving annually—11,200 M.W. & S. man-hours
Average investment in machine—$1,123.50
Saving per $1,000 investment—9,969 M.W. & S. man-hours per year

Tie Adzers

Working period—200 days per year
Adzing ties in connection with rail renewals or out-of-face gaging
Day's production—1,320 ties adzed

MACHINE OPERATION	HAND OPERATION
(1 machine)	
1 machine operator	
1 laborer	10 laborers
2 men	

Saving in force—8 men
Labor saving annually—12,800 M.W. & S. man-hours
Average investment per machine—$1,746
Saving per $1,000 investment—7,330 M.W. & S. man-hours per year

Air Spike Drivers (4 drivers and 1 compressor)

Working period—200 days
Driving spikes in connection with rail renewals or out-of-face gaging
Daily production—300 rail lengths (39-ft. rails) or 17,400 spikes

MACHINE OPERATION	HAND OPERATION
(4 spike drivers)	
1 machine operator	
4 laborers	28 laborers
5 men	

Saving in force—23 men
Labor saving annually—36,800 M.W. & S. man-hours
Average investment per machine—$5,636
Saving per $1,000 investment—6,529 M.W. & S. man-hours per year

Power Jack

Working period—200 days
Making heavy track lifts

MACHINE OPERATION	HAND OPERATION
(1 machine)	
1 foreman	1 foreman
1 machine operator	8 laborers on jacks
3 laborers	8 laborers—digging out for jacks
5 men	17 men

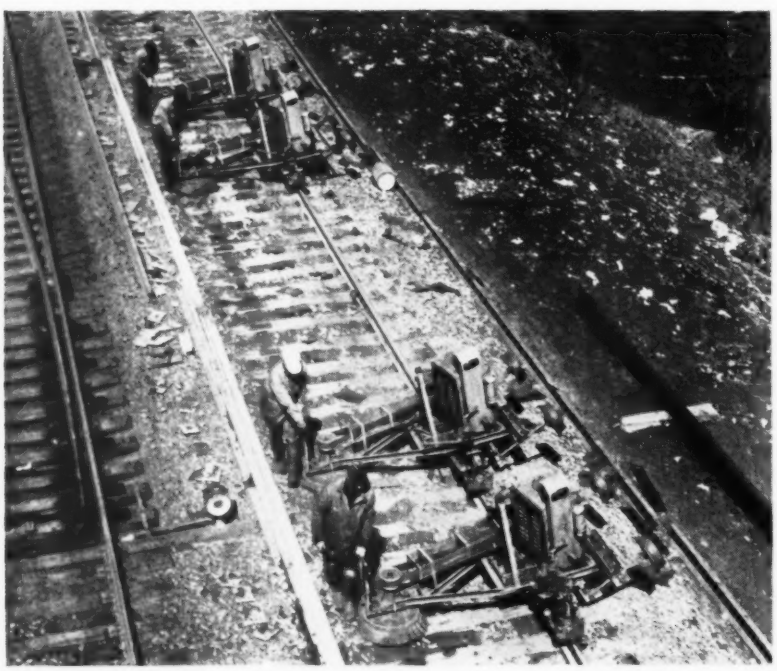
Saving in force—12 men
Labor saving annually—19,200 M.W. & S. man-hours
Average investment per machine—$1,712.50.
Saving per $1,000 investment—11,212 M.W. & S. man-hours per year.

involved in most maintenance jobs. Unquestionably, the use of machinery on a job has a tendency to inspire those employees doing certain assignments by hand to produce a sufficient amount of work to keep up with the progress of the machines. This should not be construed to mean that such men are overworked, because it is generally the practice that where a machine sets the pace, the number of men assigned to the manual tasks involved is determined by their ability to keep up with the machine without experiencing undue fatigue.

With wages and material costs soaring during the present period of so-called prosperity, the railroads are faced with the necessity of reducing unnecessary maintenance expenditures to the minimum. It would seem, therefore, that maintenance officers should prepare liberal yearly budgets for the purchase of machinery and equipment to help hold down maintenance costs.

As time goes on we become inclined to take things for granted. For example, we naturally assume that work that can be done efficiently with machines will be done with machines. When we have a large rail-laying job, we expect to have a mechanized rail-train unit to do the work. We realize that spike pulling, spike driving, adzing, drilling, nutting and denutting can be done by hand, but know that hand methods would probably require several times as many men—at a time when sufficient men to do the work in the old way are not available. Where would we be today, with present heavy traffic, without ballast-cleaning machinery?

While machinery costs have increased materially, the savings possible through the proper use of such machinery will far exceed the interest on the capital outlay required.



The figures developed in this study show strikingly the high savings in maintenance work now being realized by the use of power jacks (above) and tie adzers (below)

New Developments

New machines have been developed recently, or are being developed, which show great possibilities. I refer especially to the several types of power tie tampers and cribbing machines now in service or being developed. Large labor savings will certainly be possible with such tampers, and a really practical cribbing machine is something that maintenance men have been dreaming of for years.

Dirty tie cribs are one of the sore spots in track maintenance. The fouled ballast in cribs quickly seals the ballast at the ends of the ties, preventing proper drainage, even though the border and inter-track ballast have been cleaned recently, and except for this one feature would require no further cleaning for some time.

Unquestionably other machines will be developed to do work which we older men in maintenance have felt must always be a hand operation. It seems to me that the railroads of the country should encourage their maintenance employees to develop improved devices by assisting them in making applications for patents of these devices where it is felt they have unquestionable merit—with the understanding that the employee's own railroad may use the device without royalty payments when the patent is finally received. This, of course, would not apply where management assigns an employee to the specific task of developing a device of some kind. In such cases the railroad should be the sole owner of the patented device or machine.

Encouragement of this kind will unquestionably bring further results in the development of machinery which will substantially reduce maintenance costs.

How to Get the Most Out of Work Equipment

For a number of years the Denver & Rio Grande Western has been particularly machinery minded as regards maintenance-of-way and structures work. In this article, the author, who was formerly engineer maintenance of way, and then chief engineer, highlights the factors by means of which his road endeavors to get the most out of maintenance-of-way machines. Care in the selection of machines and operators, systematic field inspections and repairs, laboratory checks of lubricants, and daily reports, are among these factors.

By A. E. PERLMAN
General Manager
Denver & Rio Grande Western
Denver, Colo.

• Of first importance in securing a satisfactory return on the investment in work equipment is the proper selection of machines for the types of work to be undertaken. In making this selection, the following factors should be carefully checked:

(1) Speed and simplicity in operation;
(2) Adaptability to various kinds of work;
(3) Durability, to reduce maintenance to the minimum; and
(4) Standardization of units to minimize necessary repair parts stock and to reduce the time and cost required to make repairs.

The work equipment organization on the Rio Grande is headed by a supervisor of work equipment, who is constantly studying the advantages to be gained through the use of modern power tools and machines for carrying out various types of work. After discussing these methods and the units available with the division maintenance officers, recommendations are made for purchases.

Since our work equipment operators are selected from oilers, who have served an apprenticeship in the handling and maintenance of machines, we consider it of the utmost importance that these men be chosen with the idea of their ultimately becoming operators. In the event that machines of new design are to be placed in service, for which no qualified operators are available, the new machines are sent to our work equipment shop where the operators, as well as our maintenance mechanics, are instructed by factory representatives in the operation and maintenance of the machines.

Our work equipment repair shop, which is centrally located on the system and well equipped to handle all classes of repairs, is under the supervision of the supervisor of work equipment and a shop foreman. Both men are constantly striving to reduce maintenance costs on machines by studying proper repair and maintenance procedures. A repair procedure based on rotation has been inaugurated, which requires that the various machines be given a periodic general overhaul before they are worn too badly. In the event a machine becomes worn beyond economic repair, or becomes obsolete, it is recommended for replacement after a thorough study has been made by the supervisor of work equipment and the shop foreman.

Field Repairs

We have a fleet of ¾-ton pickup and panel trucks which are equipped with oxygen-acetylene and electric welding units, chain hoists, specialized tools and other equipment for making any type of equipment repairs in the field in the shortest possible time. These trucks are headquartered at and are dispatched from, the work equipment repair shop. The shop is provided with system phone service, so that upon receiving word of a breakdown of a machine in the field, the estimated necessary repair parts are loaded into a truck and a mechanic drives to the machine, where repairs are quickly made. Having been advised of the locations of all machines in the territory, the mechanic, on his return trip to the shop, stops at each machine that is working, and makes a detailed inspection of it, and performs such maintenance as is required.

We use a maintenance mechanic with our large steel gangs to watch machine performance and to make immediate, on-the-spot repairs. This contributes greatly to the efficiency of our gangs and precludes costly delays due to equipment failures. This man has an outfit car, converted into a small shop, which contains the various parts and tools that may be required throughout the season.

By using the excellent facilities of our research laboratory at Denver, we are also, in many instances, forewarned of coming engine failure due to excessive wear of bearings, rings, etc. This is accomplished by having our machine operators send in semi-monthly samples of their crankcase oils. These samples are checked for dilution or metal particles. If such particles are found, they are analyzed to determine the kind of metal. This, in turn, discloses which of the parts of the machine are wearing excessively. All parts failures are checked by a metallurgist, and his recommendations are followed when purchasing replacements.

By the use of the research laboratory it has been possible also to reduce to the minimum the varieties of lubricants required by work equipment. This, in turn, decreases the expense of handling lubricants and minimizes the possibility of using the wrong lubricant.

Scheduling and Reporting

The work of our various machines is scheduled well in advance of field operations at staff meetings attended by both system and division officers. At these meetings the work equipment program is correlated in such manner that it is possible to obtain the maximum benefits from the machines throughout the year.

Considerable importance is attached to our method of reporting work done in the field, and also to the method of recording this work by our cost department, and we know that increased efficiency has resulted.

Under this method, reports are

(*Continued on page 277*)

How to "Sell" Management

Combined in this article are the suggestions of seven maintenance-of-way officers on the question of how to get management to say "yes" when more power equipment is needed. This question is particularly appropriate this time, when mechanization of maintenance-of-way and structures operations appears to be one of the most effective answers to high labor costs. Some of the suggestions made are aimed directly at overcoming management resistance, where encountered, but others indicate that much of the blame for resistance can be laid directly to the shortcomings of maintenance officers themselves in not "making a case" for their needs, or in not utilizing effectively the machines they already have.

• There is no one best way to sell management more power tools and machines for carrying out maintenance-of-way and structures work. Every situation presented has its own best method or methods. Some of those who must put the final okay on expenditures for equipment are readily sold with convincing arguments based on facts; others, for various reasons of personality and circumstance, are "tough nuts" to crack. But possibly the most important reason why many maintenance officers are not more successful in selling their managements on adequate mechanization of their operations lies within themselves and their own organizations —they are neither sold themselves to the point where they can prepare and present convincing arguments, nor do they utilize their present equipment in a manner that engenders the confidence of management that they will utilize additional equipment any more effectively.

These, in substance, are the views of seven maintenance officers, from division engineer to chief engineer, who, facing demands for higher standards, increased production, and maximum efficiency in carrying out their work, were asked to express themselves on how best to sell management more power tools and machines for maintenance-of-way and structures work.

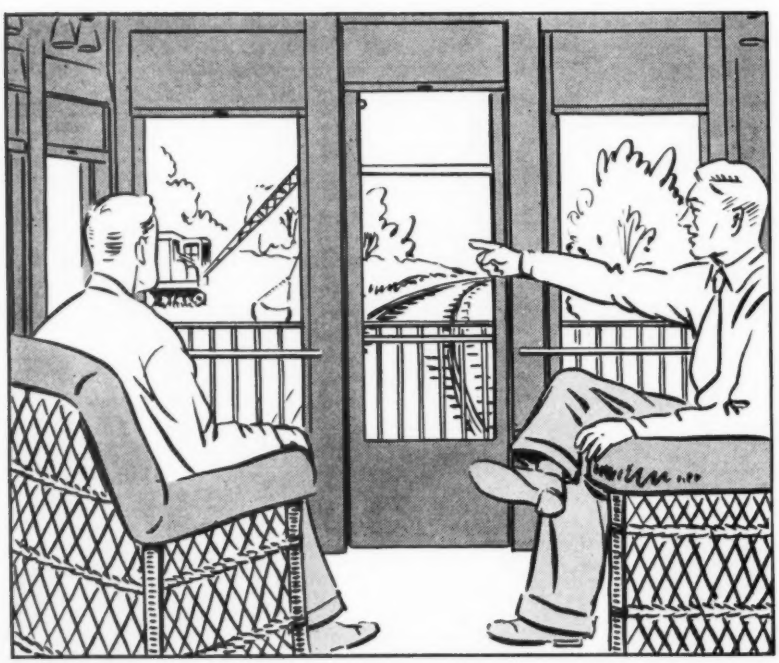
Out-Bid Other Departments

Unquestionably, railway management as a whole, fully aware of present high labor costs and the need for maximum production, are more machinery-minded than ever before. Such being the case, it has probably never been easier to sell them power tools and machines than it is today. However, with responsibility for the needs of their properties as a whole, it must be remembered that those in management are deluged with demands from all departments—and that, for maintenance officers to get even their rightful share of available money, they must often out-bid other departments with convincing facts and figures. This may not be easy at best, and it becomes especially difficult, as pointed out by several of the maintenance officers commenting, when management—possibly with a background entirely outside the maintenance-of-way department—is not innately appreciative of the possibilities in the mechanization of roadway and structures work. Special problems are presented, too, when some managements, at the present time especially train-service equipment minded, tend to treat all other aspects of their railroads as stepchildren.

But whatever the degree of resistance encountered, all those questioned agree that maintenance officers have a responsibility to sell adequate mechanization of their dedepartments. In doing this, the most commonly employed and effective method being used is to accompany budget or individual purchase requests with the most convincing arguments possible in justification of the equipment recommended. Avoid generalities, or back them up with facts and figures, it was pointed out, if you would expect the most favorable consideration.

Reflecting the practice of others, one maintenance officer says he always presents actual test data when available, securing such data from other roads where new types of machines are involved, or on his own road where the purchase of more machines of a type already in service is being recommended. Another of those questioned cautions against making extravagant claims, or of overselling an idea, which he says, may backlash with discredit to an entire purchase program, and the posibility of jeopardizing recommendations for a long time in the future.

Recognizing the pressure on management for expenditures, it is evident that those maintenance of-



No opportunity should be overlooked to discuss the advantages of mechanization

More Power Tools and Machines

"Sales" Pointers

- Analyze your "customer"
- Cite facts and figures
- Present performance data
- Refer to technical articles and advertising
- Use field demonstrations
- Cite experiences of other roads
- Enlist aid of men of all ranks
- Be sure machines are used effectively
- Avoid generalities
- Don't make extravagant claims

The suggestions shown here have proved to be effective in persuading management to approve requisitions for equipment

ficers who have been the most successful in mechanizing their operations don't rely entirely on formally written recommendations to put their ideas across. One officer in charge of work equipment, for example, says, we are endeavoring to make our men—of all ranks—machinery minded; to make them think and talk machines at all times. A division engineer states that, after he is convinced of the need for a specific machine or machines, he never loses an opportunity to promote his needs with his superior officers. In one case, he said, "it took nearly two years to get the machine I wanted, but by perseverance I got it." However, this same division engineer continued, "there are limitations to insisting on the purchase of power tools, as too much talk may produce results directly opposite from those one hopes to obtain."

Convinced of the value, if not necessity, of sales enthusiasm and talk, an assistant engineer maintenance of way pointed out that he encourages his division engineers, whenever riding over the line with the president or other executive officers, to grasp every opportunity to explain the need for equipment they do not have at all or have in inadequate numbers. Reflecting this attitude, one of the division engineers under this maintenance officer says that "all supervisory officers should constantly be on the alert for needed machines that will effect economies on their particular territories, and at every opportunity should bring their needs to the attention of management, explaining the need and the benefits to be derived."

The assistant engineer maintenance of way in question, who has had particular difficulty in convincing his management of the need for air dump cars for transporting dirt and rip rap, and for modern ballast cars that can be made to deposit the ballast between the rails and on the shoulders, would welcome "a lot more talk" by maintenance officers generally in promoting these types of equipment with railway managements, and especially his management. Because of the high cost of such equipment, he says, managements seem to feel that other types of cars may be used as substitutes. He would also welcome more promotion with his management of the many good reasons why the maintenance-of-way and structures forces should have more automobiles and trucks for carrying out various work.

Field Demonstrations Helpful

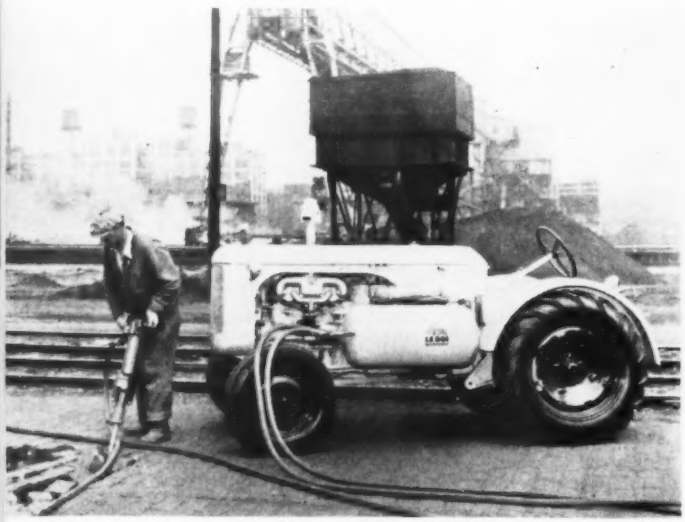
To sell management, one maintenance officer suggested the value of getting operating officers to view machine performance in the field, with the hope of securing their backing of recommendations for equipment purchases. Another cited an example of "putting across" a big deal for certain costly machines by letting his vice-president sell himself at a field demonstration. Others stated that they never fail to refer to their superior officers articles or advertising pertaining to equipment they need—particu-

(*Continued on page 277*)

Small Power Plants f

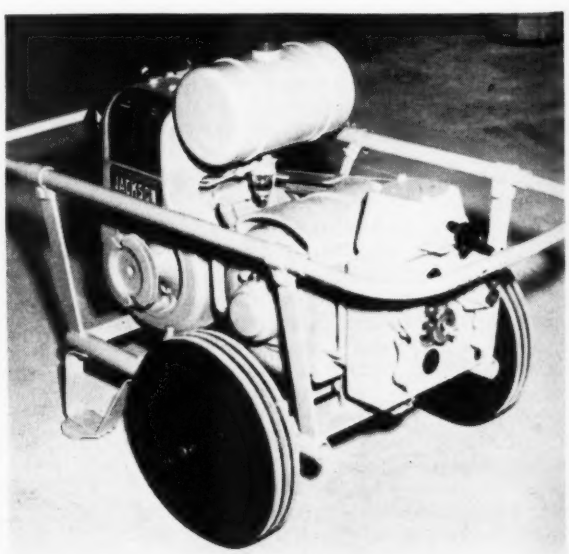
Availability of portable units in a variety of types and sizes makes it possible to realize all the advantages of labor-saving tools and equipment practically anywhere by work gangs of limited size

Shown above is Ingersoll-Rand's Spot-Air compressor. Will operate drills, grinders, impact wrenches, paving breakers, etc. With aid of wheelbarrow mounting it can be moved by one man



Above—LeRoi 105 Tractair consists of compressor incorporated in 4-wheel rubber-tired tractor. Various attachments are available to increase versatility. Below—Homelite 2500-watt generator running heavy-duty electric drill on railroad job. Company manufactures a-c., d-c., and dual-purpose high-cycle generators

Above—Schramm Model 60 compressor furnishing air for breaking up a concrete floor. Also available with crawler and skid mountings. Below—The Jackson Model M-1 gas-electric power plant. Capacity 1.25 kva. (1250 watts) single-phase and 3-phase 110-volt 60-cycle. Other plants have capacities of 2.5 and 5 kva.



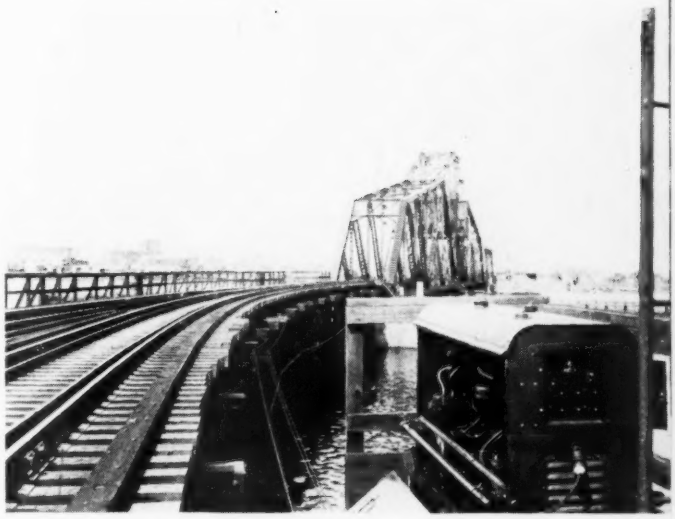
ts for B. & B. Work

• To take full advantage of the benefits of machine power the bridge and building forces of the railroads must have small portable power plants that can be easily transported and handled at the work site by a few men. Recognizing this need the manufacturers are offering a variety of such plants, which may be grouped into three general classifications, namely: (1) Engine-driven electric generators; (2) air compressors; and (3) gasoline engines for driving tools through flexible shafts. In addition, some manufacturers offer various tools, such as chain saws and concrete breakers, which incorporate a small gasoline engine as an integral part of the unit, but these are not included in this discussion.

Considerable activity has been evident in recent years in the development of portable gasoline-engine driven generators, with the result that these are now available in a variety of capacities and types to meet almost any need, while retaining a high degree of portability, even in units with capacities as high as 5 kva. or 5000 watts. Some generators produce three-phase 60-cycle current and have 110-volt single-phase outlets for operating tools with universal a.c.-d.c. motors. Among the most recent developments is a 180-cycle generator for operating high-cycle tools, which has a 110-volt outlet for driving universal tools.

Air compressors with capacities as small as 60 cu. ft., with wheel, crawler or skid mountings, are produced by a number of manufacturers, and one makes a compressor for railway use that has a capacity of only about 30 cu. ft. Attention here is concentrated on the small, highly portable units, although it is a fact that portable compressors with capacities ranging up to more than 300 cu. ft. are used extensively.

Pictured on these two pages are examples of these several types of small portable power plants.

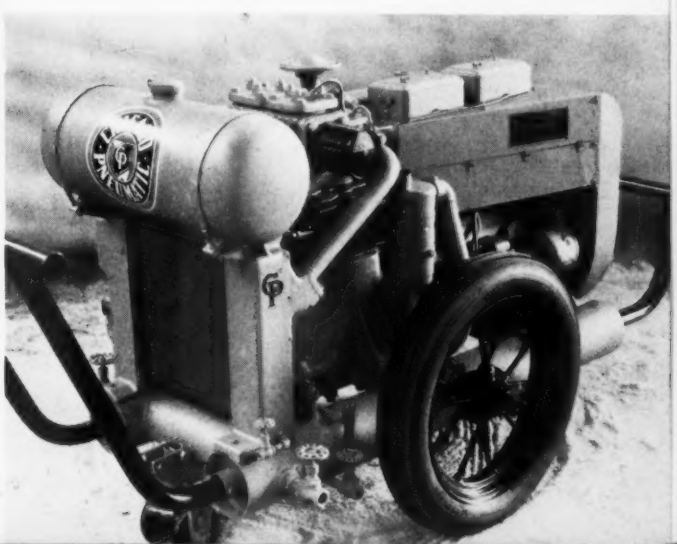


Above—The Onan Model W3S 115-volt d-c. electric plant, with capacity of 3000 watts, furnishing power for operating drills, saws and other tools on a bridge job. Company makes many other sizes

Right — Mall 1½-hp. gasoline engine operating wood auger through flexible shaft. Other attachments include sump pumps, vibrators, grinding wheels, brushes, sanders, angle spindles

Below—Worthington "Blue-Brute" 60-cu. ft. portable compressor operating wood auger on a bridge job. Pneumatic-tired mounting is standard, but steel-wheel or skid mountings are also available

Below—Chicago Pneumatic 60-cu. ft. "Patrol" compressor. Units of this size can operate tools such as grinders, riveting hammers, tampers, impact wrenches, and chipping hammers



Left—The upholstering shop and the shops for repairing pneumatic tools, and small engines and motors, are located on the Mezzanine level, shown in this view. Right—Working on a crane in the high bay of the shop, which is equipped with an overhead crane

New Haven's System Work Equipment S

For years the New York, New Haven & Hartford has maintained a large, highly-modern shop at New Haven, Conn., for making repairs to the work equipment used by its maintenance forces. Not long ago the building occupied by the shop was converted for use in repairing Diesel locomotives, and, incident to this development, the work-equipment shop was moved to new quarters at the same point. Specially designed for its intended purpose, the new shop is arranged and equipped in accordance with experience gained with the original facility, the object being to provide a means of making equipment repairs with maximum effectiveness and at a minimum cost.

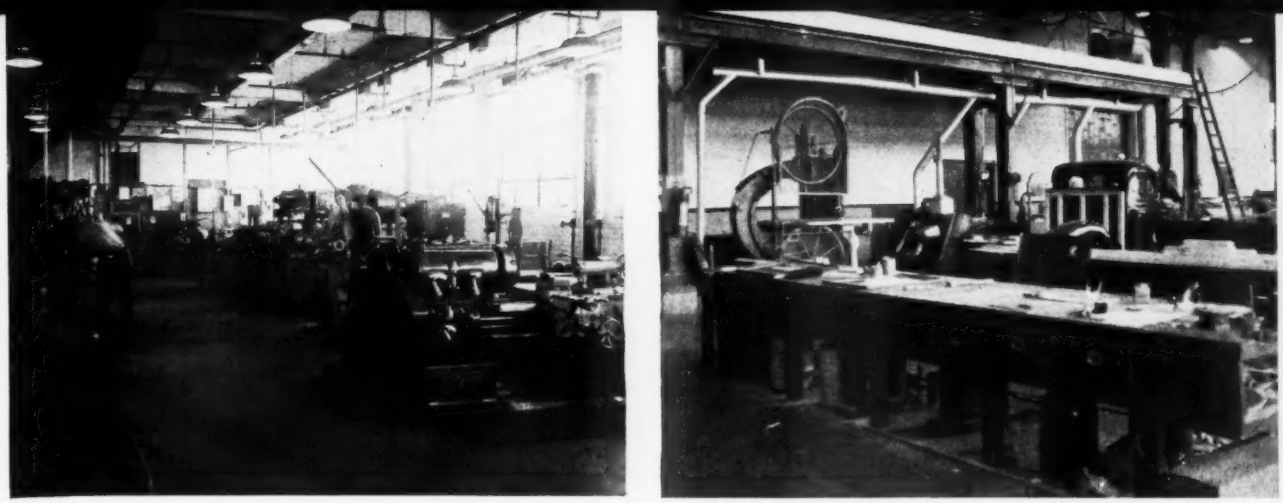
• Machines used by the maintenance of way department of the New York, New Haven & Hartford are now being repaired in a new shop that, in some respects, is even more modern than its predecessor, which was considered by many to be one of the most complete and modern work-equipment repair shops in the country.

The story in brief is that the company's work-equipment shop, located at the system headquarters at New Haven, Conn., has been transferred to a new and even more modern building at that point, where experience in the operation of the old shop was a guide in dictating the arrangement of departments and machines, and where special attention was given the matter of providing favorable working conditions for employees. Designed to handle repairs for over 3000 units of work equipment owned by the railroad, the new shop, because of the large array and variety of power-driven tools and devices with which it is equipped, is a testimonial in itself to the machine-mindedness of the New Haven.

The Organization

Maintenance of way work equipment on the New Haven was originally repaired and maintained by the mechanical department, but as the number of types and units in service increased it became clear that their maintenance and repair comprised a highly-specialized function, requiring a specially-trained organization. Accordingly, a separate organization was established under the direct supervision of the supervisor of welding and equipment, which is charged with the responsibility for maintaining in efficient operating condition practically all units of equipment operated by the maintenance department, as well as certain types of equipment assigned to other departments. For instance, the equipment maintained includes all types of scales used on the railroad and all electric vehicles, such as battery-driven tractors used for hauling baggage trucks. Of special interest is the fact that a large number of auto-

The new work-equipment shop, looking north. Objects on side of building in background are part of system for disposing of sawdust from the carpenter shop



Left—The machine shop is equipped with a wide variety of such tools as lathes, drill presses, shapers, milling machines, grinders and others. Right—Part of the carpenter shop. Note the ducts in background for exhausting sawdust from woodworking machines

nt Shop Is Designed for Efficiency

motive vehicles is used by the maintenance and other departments of this road and the responsibility of keeping these in good working order also lies with the work equipment-maintenance department.

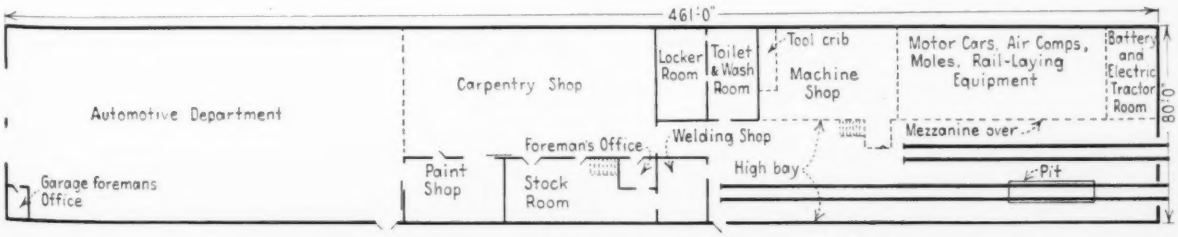
In discharging its responsibilities this department not only maintains a field organization of mechanics for inspecting and repairing machines on the job, but, for doing overhauling work and making relatively heavy repairs, a system shop is maintained at New Haven, which is centrally located relative to the company's network of lines. The original shop occupied a building that was constructed initially as a car-repair shop. Recently it was desired to convert this building into a shop for repairing Diesel locomotives, and for this reason it was decided to transfer the work-equipment repair shop to a new structure at New Haven, adapted for this purpose.

In over-all dimensions the new building is 80 ft. wide and 461 ft. long, with the long dimension lying in a north-south direction. Structurally, the building is composed of two parts. The southerly portion, 260 ft. long, consists of a building that was originally located at Stamford, Conn., where it served as an inspection shed for multiple-unit equipment used in the electrified territory of the New Haven between New York and New Haven. This was an all-steel building 40 ft. wide and 520 ft. long, with the roof supported on steel trusses. These trusses carried a roof deck of corrugated metal covered with composition roofing. The siding also consisted of metal, and in each side wall there were two continuous lines of windows.

In adapting the old inspection shed to its new function it was dismantled and shipped to New Haven for re-erection on the site of the new work-equipment shop. In reassembling the building it was divided transversely at the center and the two halves were erected side by side to form a structure 80 ft. wide and 260 ft. long, with a line of columns along the center. The walls of the building were covered on the inside with wood sheathing and a concrete floor was provided throughout.

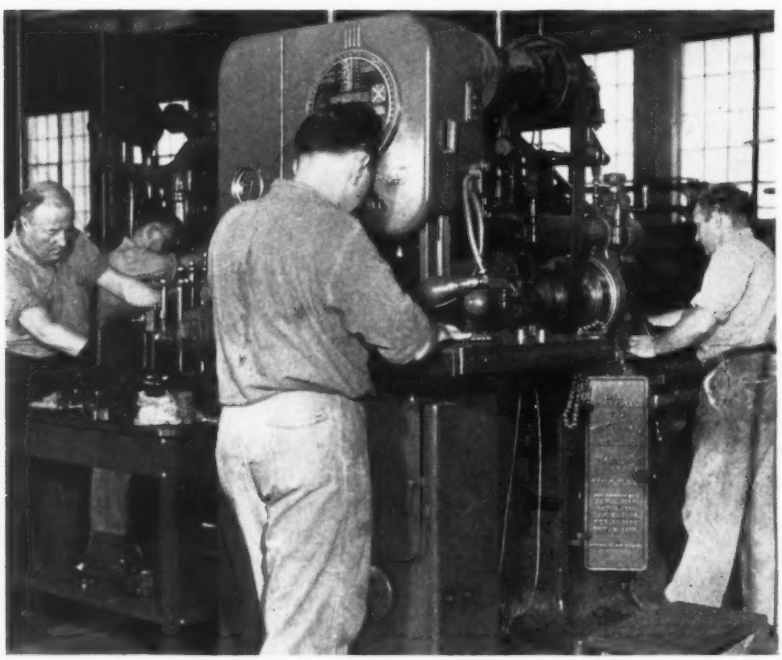
The other portion of the new shop building, forming the northerly part of the structure, is of brick, steel and concrete, and is 80 ft. wide and 201 ft. long. This portion of the building is divided longitudinally into a high bay and a low bay. The high bay is equipped with a 15-ton overhead crane and has two tracks entering it through doors in the north end, so that track-mounted equipment can be brought into this portion of the structure. The low bay has a second-floor or mezzanine level which occupies the entire area of this portion of the building. Like the south section the north portion of the shop has window space for daylight illumination, and all working areas are floored with concrete The entire shop is equipped with air lines and outlets, these being supplied by a 160 cu. ft. compressor.

In designing the new building, special attention was given the matter of providing sufficient amount of well-located office space for the officers in charge and their clerical help. These are located at the southerly end of the mezzanine level where they are centrally-located with respect to the shop as a whole. Unlike many offices



Plan of the main floor level of the new work-equipment repair shop

Making bags for carrying ballast is one of the jobs of the upholstering department



A corner of the machine shop, showing work under way (left to right) at the rod borer, a drill press, the Doall machine and a milling machine

found in mechanical shops, they are finished and furnished in accordance with the latest practice, providing cheerful, well-lighted surroundings.

The office space is subdivided into a number of rooms, including a relatively large office for the clerical staff, a drafting room, a room for road mechanics, separate offices for the supervisor of welding and work equipment, and the assistant supervisor of work equipment, and toilets for the office workers. A feature here is a signal system, involving the use of horns placed strategically in the shop and actuated by a push button, by means of which the members of the staff may be called to the office or telephone.

The floors of the offices are covered with marbleized asphalt tile in red and black squares arranged in a checkered pattern. The walls are of plaster painted a cream color above a dark dado. Heat is furnished in the offices by steam radiators, and in the shop areas by overhead unit heaters supplemented by radiators along the walls.

The toilet and locker-room facilities provided for shop employees are modern and well equipped. Located on the main level directly under the offices, these are divided into two rooms, one of which contains the toilets, a three-stall shower and three circular wash fountains with foot-operated valves and soap dispensers. In the other room are located metal lockers for the men and tables and benches.

For fire protection there is an overhead automatic sprinkler system serving the entire structure, including the offices, which is supplemented at various points by other types of fire-fighting apparatus, depending on the nature of the hazard. The other types of fire control used include carbon dioxide extinguishers with fog nozzles, Pyrene extinguishers, and water pump extinguishers of the tank type.

Shop Is Departmentalized

The working areas of the shop are subdivided and arranged in accordance with a plan under which separate areas are provided for handling repairs to equipment of different types or classifications. Such areas are liberally provided with tools, individual tool cabinets, bench space and any special equipment or devices that may be required in testing or making repairs to the particular machines handled. In addition to the departmentalizing of the shop on this basis there is a machine shop, a carpenter shop, a welding shop, a paint shop, and a room for testing and making repairs to electrical equipment, all of these being completely equipped with a wide variety of power machines and power tools.

The working space on the mezzanine level is devoted to operations in which the materials, parts or machines handled are relatively light. Separate areas are set aside here for testing and repairing pneumatic tie-tamper guns and other air tools, for repairing and adjusting all types of scales used on the railroad, and for repairing and rebuilding motors and small engines. Also on this level is an upholstering shop and an electrical testing and repair room.

Special equipment on the mezzanine level for carrying out the operations performed there includes a meter for testing the air consumption of tamping guns and other pneumatic tools, several different types of grinders in the scale shop, and three sizes of sewing machines in the upholstery shop where repairs are made to truck seats, tarpaulins, and other such items.

The electrical testing and repair room is equipped for handling all types of electrical devices, such as engine starters, distributors, and electric-driven grinders, drills and saws. In this room is a complete set of electrical testing equipment, a device for testing

spark plugs, and such items as voltmeters and ammeters.

Underneath the mezzanine on the main floor level, the working area is devoted to a repair shop for electrical vehicles; an area for repairing air compressors, motor cars, ballast Moles, rail-laying equipment and similar units; and the machine shop. Equipment provided in the repair shop for electrical vehicles includes two battery-charging units, one of which is of the quick-charge type.

The machine shop is provided with a complete complement of the most modern machine tools and other equipment. These include metal-spraying equipment for building up worn crank shafts, etc.; six lathes ranging in size from 11 in. to 21 in.; two 21-in. drill presses; one large radial drill; two shapers; one planer; two milling machines; one Doall machine; one bolt-threading machine; one crank-shaft regrinder; and various types of grinders. Adjacent to the machine shop is a tool crib, enclosed in wire mesh, where special tools are kept.

Practically the entire area in the high bay in the northerly part of the building is used for making repairs to cranes, ditchers and similar large units of equipment. To aid in inspecting and repairing track-mounted machines, one of the tracks extending into this portion of the structure is equipped with an inspection pit. At the southerly end of the high bay is located the welding shop where the equipment provided consists of three portable 400-amp. arc-welders of the plug-in type, two positioning tables, two grinders, and a full line of oxy-acetylene welding equipment.

Grouped at the north end of the southerly part of the shop are the paint shop, the stock room, an office for the foreman of the work-equipment repair shop, and the carpenter shop. Equipped with spray-painting equipment, the paint shop is enclosed in a fireproof room which is separated by fire doors from other parts of the shop. The paint shop also has an extensive exhaust system for removing dangerous and highly-combustible fumes.

An unusually complete set of woodworking machines is found in the carpenter shop. These include two band saws, two table saws, a tenoning machine, two jointers, two planers, one DeWalt saw, one lathe, one jig saw and a variety molding machine.

A feature of the carpenter shop is an exhaust system for disposing of the sawdust produced at the various machines. In this arrangement the sawdust is exhausted through a system of ducts with an intake at each machine. The sawdust is drawn into the ducts by a motor-driven blower and is conveyed to a hopper outside the building, which is so designed that the sawdust may be dumped directly into motor trucks for disposal.

Reseating valves (left) and reboring the block of an engine in the automotive shop

Complete Automotive Shop

A major portion of the southerly section of the new building is occupied by the automotive repair shop or garage which is under the direct supervision of a foreman who devotes his full time to this work. Vehicles gain access to this portion of the shop through two overhead rolling doors at the south end. Like all other departments of the shop, the garage is thoroughly equipped with all manner of modern tools and devices for facilitating and aiding the work of repairing and overhauling automotive vehicles. The equipment provided for rebuilding and overhauling motors includes a line-boring machine, a valve-refacing machine, two cylinder-boring bars, a larger boring bar, and three motor test stands. Special tools include connecting-rod lining fixtures, a small connecting-rod straightening press, line reamers, and special taps and dies. Also there is a set of electrical testing equipment and a complete greasing system with a hydraulic lift. A small motor-driven air compressor furnishes air for the greasing system.

Experience with the original work equipment shop indicated the need for ample artificial and natural illumination, which has been provided to a high degree in the new shop by means of large window space, a generous number of drop lights for general illumination throughout the shop, and by the lighting of specific machines and areas where needed. To enhance the desired effect, the interior walls and roof areas were painted in light colors.

In connection with the moving of the equipment to the new shop, all machines were painted in accordance with a color scheme designed to promote safety. Specifically, all moving parts were painted a peach color, and all fixed parts were painted green.

Work equipment is sent to the shop in accordance with a system designed to insure that all machines will be given the optimum amount of attention required to keep them in good working condition at all times, not overlooking the necessity of routing the equipment through the shop in an orderly manner. Practically all machines that are used on a seasonal basis are sent to the shop at the end of the working season for a general check-up and overhauling. Such units include tie-tamping compressors and generators, tamping tools, rail grinders, power adzers, bolt tighteners, Mole ballast cleaners and pneumatic spike drivers.

Such units as cranes, ditchers and draglines are inspected periodically in the field and are brought into the shop when these inspections indicate the need for general repairs. To the end that the load in the shop will be spread as evenly as possible over the year, an attempt is made to concentrate the shop work on motor cars during the summer months.

The new shop was designed and built, and is operated, under the general supervision of E. E. Oviatt, Chief Engineer of the New Haven, and A. A. Cross, Engineer Maintenance of Way. The operation of the shop is under the direct supervision of Edward E. Turner, Supervisor of Welding and Work Equipment, assisted by Earl E. Timothy, Assistant Supervisor of Work Equipment.

A.R.E.A Program Reveals Many

Forty-Eighth Annual Meeting, Palmer House, Chicago

Tuesday, March 15

MORNING SESSION—Grand Ballroom—9:45 A.M.

Address of C. H. Mottier, pres.
Report of Secretary
Addresses as follows:

Max Ruppert, pres., N.R.A.A.
J. H. Aydelott, vice-pres., A.A.R.
Ralph Budd, pres., Burl. Lines
H .T. Heald, pres., Ill. Inst. of Tech.

AFTERNOON SESSION—2:00 P.M.

Grand Ballroom

Reports of Committees

Roadway and Ballast
Roadbed Solidification, by Rockwell Smith, roadway engineer, A.A.R.
Ties
The Future of Timber Supply, by C. D. Turley, engr. ties and treat., I.C.
Economics of Railway Location and Operation
Maintenance of Way Work Equipment
Economics of Railway Labor

Red Lacquer Room

Reports of Committees

Iron and Steel Structures
Future of Structural Engineering in Relation to Railroad Bridges, by Shortridge Hardesty, cons. engr.
Impact and Bridge Stresses
What We Know About Impact, by A. B. Chapman, asst. ch. engr., C.M.St.P.&P.
Uniform General Contract Forms—Waterproofing—Wood Bridges and Trestles—Clearances—Masonry
The Repair of Masonry Structures, by A. N. Laird, ch. engr., G.T.W.

EVENING SESSION—Grand Ballroom—8:00 P.M.

The Achievements of the A.R.E.A., by H. R. Clarke, ch. engr., Burl. Lines
Motion Picture—"Wheels A'Rolling"—Entertainment

Wednesday, March 16

MORNING SESSION—Grand Ballroom—9:00 A.M.

Presentation and Approval of Manual Material
Addresses as follows:

The Effect of Diesel Operation on Fixed Property of American Railroads, by J. B. Akers, ch. engr., Sou. Sys.
Investigation of the Relation Between Track and Equipment, by J. R. Jackson, mech. engr., Mech. Div., A.A.R.
Future of Soil Mechanics in Railroading, by Dr. R. B. Peck, res. prof. of soil mechanics, Univ. of Ill.
How Can the Railroad Construction and Maintenance Engineer Best Meet Increasing Cost of Labor and Material?
By Heavier Rail—F. R. Layng, cons. engr., B.&L.E.
By Increased Mechanization—S. R. Hursh, asst. ch. engr.—maint., PRR
By Roadbed Stabilization—T. A. Blair, ch. engr. sys., A.T.&S.F.

AFTERNOON SESSION—2:00 P.M.

Grand Ballroom

Reports of Committees

Wood Preservation
Recent Developments in Preservation Treatment, by Dr. Hermann von Schrenk, cons. timb. engr.
Track
Rail

Red Lacquer Room

Reports of Committees

Yards and Terminals
Records and Accounts
Buildings
Water Service
Recent Developments in Water Treatment, by R. C. Bardwell, supt. wat. sup., C.&O.

WEDNESDAY EVENING ANNIVERSARY BANQUET

Address by W. T. Faricy, pres., A.A.R.
Address by James E. Gheen

Thursday, March 17

MORNING SESSION—9:00 A.M.

Reports of Committees

Highways
Achievements of Grade Crossing Protection, by W. J. Hedley, asst. ch. engr., Wab.
Cooperative Relations with Universities
Presentation and Approval of Manual Material
The Future of Research on American Railroads, by G. M. Magee, res. engr., A.A.R.
The Future Opportunities of the A.R.E.A., by E. M. Hastings, ch. engr., R.F.&P.

Special Features

Activities at fiftieth annual meeting to deviate widely from usual practice. Will include many addresses, an evening session and a banquet, and a photographic exhibit of engineering progress consisting of about 600 pictures

C. H. Mottier
President
American Railway Engineering Association

• That the Golden Anniversary meeting of the American Railway Engineering Association, to be held at the Palmer House, Chicago, March 15-17, will go down in history as one of the most notable gatherings ever to be held by this association is a foregone conclusion. Under the direction of President C. H. Mottier, a year of work and planning has produced a program in which the association's fiftieth anniversary is used as the foundation for a round of activities that promises to be at once interesting, impressive and stimulating.

To readers who are familiar from past experience with the usual pattern of activities at A.R.E.A. conventions, a study of the program on the opposite page will reveal the extent and manner in which this year's meeting will deviate from customary practice. The unusual number of addresses to be heard comprises one of the most notable points of departure. Not counting the evening sessions, the program calls for 21 addresses, including five at the opening session, eight to be presented at various times in conjunction with reports of standing committees, six during the Wednesday morning session, and two at the closing session—most of them on problems or subjects that are of pressing importance at the present time.

To allow time for these unusual activities an innovation will be introduced in the manner of presenting committee reports and of considering committee recommendations regarding Manual material. Except for two reports that will be heard at the Thursday morning session, the presentation of committee reports will be confined to the afternoon sessions on Tuesday and Wednesday, and during each of these periods the meeting will be converted temporarily to the sectional type, viz., with two separate sessions in progress at the same time. In order that Manual recommendations may be considered by the group as a whole the program provides for two occasions during the Wednesday and Thursday morning sessions when such material will be presented separately from the committee reports.

Another departure from usual practice is presented by the evening session on Tuesday. The program for this session is designed to appeal to women as well as men, and the women will be invited to attend. Reviving an early custom that was discontinued during the depression years, there will be a banquet Wednesday evening, the highlight of which will be the address by President Faricy of the Association of American Railroads.

Under the heading of special attractions must be mentioned the exhibit of photographs picturing progress in railway engineering, which will be displayed on the convention floor of the hotel during the meeting. This will consist of about 600 photographs, classified and attractively mounted in groups on easels for convenient inspection.

PRESIDENT MOTTIER SAYS—

To those readers of *Railway Engineering and Maintenance* who are members of the American Railway Engineering Association this statement will serve as a last-minute reminder of the Golden Anniversary meeting to take place at Chicago March 15-17. To them, and also to engineering and maintenance officers who are not members, it will constitute a cordial invitation to attend this meeting and to participate in an event of unusual interest and significance.

The fact that the A.R.E.A. is completing 50 years of constructive effort affords an opportunity to take stock of the progress that has been made in the field of railway engineering during this period and to consider the possibilities for further progress in the future. With these thoughts in mind the program of the anniversary meeting has been planned along unique lines, embodying as it does an unusual number of addresses on diverse subjects, although ample time is afforded for the consideration of committee reports.

Other special features of the program that are certain to stimulate interest are the evening session on Tuesday, the Anniversary banquet on Wednesday evening, and the comprehensive pictorial exhibit of engineering progress which will be displayed on the convention floor of the hotel. To these must be added the record exhibition of manufacturers' products which the National Railway Appliances Association will sponsor at the Coliseum—an exhibit that, because of its scope, is sure to be unusually interesting and instructive.

Any railway engineering officer attending this meeting is certain to come away with a keener appreciation of the achievements of his predecessors, of the opportunities for further advances, and of the role which the A.R.E.A. has played and will continue to play in furthering such progress.

N.R.A.A. to Present

With 113 member companies participating the display of manufacturers' products to be on view at the Coliseum during A.R.E.A. meeting will be largest in at least 25 years. Our readers are invited to attend

Max K. Ruppert
President,
National Railway Appliances Association

PRESIDENT RUPPERT SAYS—

I take pleasure in extending to the readers of *Railway Engineering and Maintenance*, on behalf of all members of the National Railway Appliances Association, a cordial invitation to inspect the Fortieth Annual exhibition of our association, to be held at the Coliseum, Chicago, on March 14-17, coincident with the Golden Anniversary meeting of the American Railway Engineering Association.

In this exhibit, our member companies will present for your inspection a display of modern machines, tools and materials used in the construction and maintenance of railway properties, which, in size and scope, will far surpass any previous exhibit for many years. Not only will you be surprised by the comprehensive nature of the exhibit, but also by the number of new or improved products that will be on display—products that have been developed to aid you in your efforts to obtain higher construction and maintenance standards at minimum cost.

We feel that such an exhibit—as evidence of the important role of railway supply manufacturers in engineering progress—is particularly appropriate at this time when the A.R.E.A. will be celebrating its Golden Anniversary, and know that you will want to make attendance at the exhibit an integral part of your convention activities. I know that I speak for every one of our members when I assure you of a cordial welcome and of every assistance in the solution of your problems.

List of Exhibitors

Achuff Railway Supply Company, St. Louis, Mo.—rail anchors, spring washers, tie-saver track pad, rail & curve lubricator. **Space 59**

Air Reduction Sales Company, New York—hard-facing alloys, rail-cropping machine, carbide lamps, flame-cleaning, dehydrating apparatus, display of acetylene, oxygen, helium, argon, nitrogen, carbonic-gas and hydrogen cylinders. **Space 2**

Alum-Atic Tube Systems, Inc., Cincinnati, Ohio—pneumatic tube systems. **Space 142**

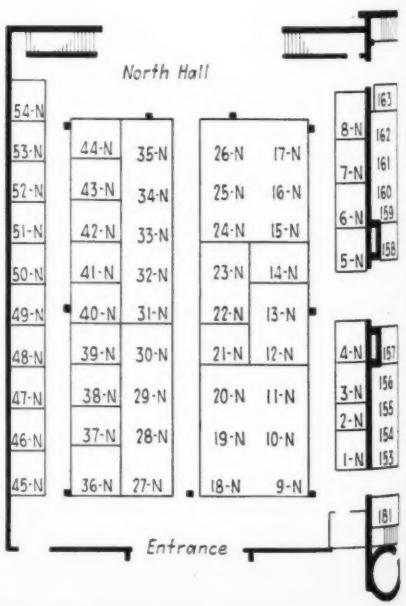
American Fork & Hoe Co., Cleveland, Ohio—rail anchors, safety rail forks. **Space 80**

American Hoist & Derrick Company, St. Paul, Minn.—enlarged photograph of 25-ton Diesel locomotive crane, blocks and sheaves, hand winches, clips, Diesel-electric locomotive crane. **Space 74-75**

Armco Drainage & Metal Products, Inc., Middletown, Ohio—steel buildings with shed-type roof, various types of metal drainage pipes and products, and a specimen of ingot-iron culvert pipe having 40 years of railroad service. **Space 26-27**

Austin-Western Company, Aurora, Ill.—large photographs and an air-operated miniature of a 30-yard, dual-side, pivot drop door automatic air dump car. **Space 85**

Barco Manufacturing Company, Chicago—flexible-ball pipe joints, gas-operated unit tampers, hammers, drillers, rammers and spike drivers. **Space 81**



• Railway men attending the American Railway Engineering Association Golden Anniversary meeting at Chicago, March 15-17, will find that an exhibit of materials, devices and equipment used in the construction and maintenance of railway tracks and structures, has been prepared for their inspection at the Coliseum, which will be larger and more complete than any similar event during at least the last 25 years. At this exhibit, presented under the sponsorship of the National Railway Appliances Association, a total of 113 manufacturers will display their products in 237 booths. So great was the demand for space that, as shown on the accompanying floor plan, it was necessary to occupy both the North and South halls of the Coliseum as well as the main exhibit hall.

The exhibit is being directed by Max K. Ruppert (P & M Co.), as president of the N.R.A.A., R. B. Fisher (Buda Company), as secretary, and Lewis Thomas (Q & C Co.), as assistant secretary and director of exhibits. A complete list of the exhibitors, including the products to be displayed, is given on the following pages, along with booth numbers corresponding with the numbers shown on the floor plan.

Record Exhibit

Bell Aircraft Corporation, Buffalo, N.Y.—power-driven, three-wheel, mechanically-dumping barrow. **Space 5N**

Bernuth, Lembcke Company, New York—elastic rail spikes, tie-plate anchor spike, literature. **Space 124**

Binks Manufacturing Company, Chicago—portable paint spraying outfits, pressure tanks, spraying equipment, pressure oiler, and displays of spray booths. **Space 177**

Bird & Son, Inc., East Walpole, Mass.—sections of crossties on which tie pads have been in actual service. **Space 275-285**

Buda Company, Harvey, Ill.—roadbed grouter, Diesel-electric generator set, power track drill, power rail bender, aluminum-alloy track jack. **Space 42-62**

Butler Manufacturing Company, Kansas City, Mo.—section of rigid-frame, truss-clear, steel building, transparencies showing various uses of steel buildings, pictures of bulk oil-storage tank facilities, pictures of facilities for the manufacturing of special products. **Space 22N-23N**

Caterpillar Tractor Company, Peoria, Ill.—crawler tractors, bulldozers, cable-control crane attachment, winches, and various parts. **Space 93-94-95-96-113-114-115-116**

Chain Belt Company, Milwaukee, Wis.—a concrete pump in operation pumping concrete through a 12-ft. pipeline loop, portable self-priming water pumps, colored illuminated pictures of concrete mixers, truck mixers in operation. **Space 15N-16N-17N-24N-25N-26N**

Chicago Pneumatic Tool Company, New York—air compressors, gasoline unit tampers, pneumatic tampers, spike drivers, drills, wood borers, impact wrenches and grinders, electric tools. **Space 98-99-100**

Chipman Chemical Company, Inc., Bound Brook, N.J.—de-icing grease and liquids, weed-killing service, literature. **Space 24-25**

Crerar, Adams & Co., Chicago—Pipe wrenches, railroad crayons, cutting edge tools, track tools, bonding and track drills, electric lanterns, hydraulic jacks, torches, tool handles, reflectorized signs. **Space 87**

Cullen-Friestedt Company, Chicago—motion pictures of rail laying cranes in action, rail tongs, clamshell buckets, crane accessories. **Space 63**

Dearborn Chemical Company, Chicago—rust preventive for structures, water proofing for concrete structures, rust preventives and lubricants for joints, joint bar fillers, protective coating for aerial cables, wrappers for pipe line protection, feed water treatment proportioning equipment and chemical pumps, railroad de-ionizing equipment, railroad cleaners for motive power and rolling stock, and high speed motion pictures showing the mechanics of steam bubble formation and action of Polyamide-type anti-foams. **Space 43-44-45**

Henry Disston & Sons, Inc., Philadelphia, Pa.—one and two-man gasoline-powered chain saws, pneumatic-powered chain saw, chain saw precision grinder. **Space 179**

Duff-Norton Manufacturing Company, Pittsburgh, Pa.—track jack, bridge jack, car jack, locomotive jacks, aluminum track jack. **Space 110-111**

Eaton Manufacturing Company, Massillon, Ohio—various types of spring washers, panel displays showing historical advance and development of spring washers since 1899. **Space 82-83**

Electric Tamper & Equipment Co., Ludington, Mich.—vibratory tie tampers, gas-electric generator sets, interchangeable tamping blades, motion pictures showing the multiple tampers in use. **Space 77-78-79**

Encyclopaedia Britannica, Inc., Chicago—research service, copies of publication. **Space 137**

Fabreeka Products Company, Boston, Mass.—samples, literature and installation photographs of composition materials used to absorb vibration and shock in bridges, turntables, crossings, tunnels, scales, and tie pads for reducing mechanical wear of ties. **Space 178**

Fairbanks, Morse & Co., Chicago—motor cars, push and trailer cars, wheels, pumps, light plants, scales, electric motors, portable lamps, illustrations of locomotives, locomotive models. **Space 48-49-50-51-68-69-70-71**

Fairmont Railway Motors, Inc., Fairmont, Minn.—inspection, section and gang motor cars, weed mower, grouting outfit, train order stand, tie sprayer, power sickle mower, highway-rail motor car, oil-spray car, motor-car accessories, compressor trailer and electric starter. **Space 129-130-131-132-133-134-147-148-149-150-151-152**

Frog, Switch & Manufacturing Co., Carlisle, Pa.—solid manganese self-guarded frog, solid manganese one-piece guard rail, 20-ft. heat treated switch point. **Space 12-13**

G & H Rail Controls, Inc., Kansas City, Mo.—rail anchors. **Space 4N**

General Chemical Division of Allied Chemical & Dye Corporation, New York—reproductions of noxious weeds, photographs and projected slides of successful weed killer operations, literature on weed killer formula. **Space 175**

Gravely Ia-Nois, Inc., Davenport, Iowa—two-wheel tractor including the following attachments: sickle mower, a rotary lawn mower, a rotary power brush, and a snow plow. **Space 176**

Griswold Signal Company, Minneapolis, Minn.—automatic crossing gate with flashing lights, crossbucks, track sign, "Stop on Red Signal" sign, 40-ft. gate arm, automatic sidewalk gate with 15-ft. arm, rotating banner with flashing lights, large instrument case with false back, varied assortment of instrument cases, battery boxes, concrete foundations, individual parts including control panels, gate mechanism, gate motor, gate hold clear, gate controller, gate buffer, gate arm shaft, gate arm lamps. **Space 103-104-105-106-107**

Harco Corporation, Cleveland, Ohio—rust preventive, cathodic protection. **Space 2N**

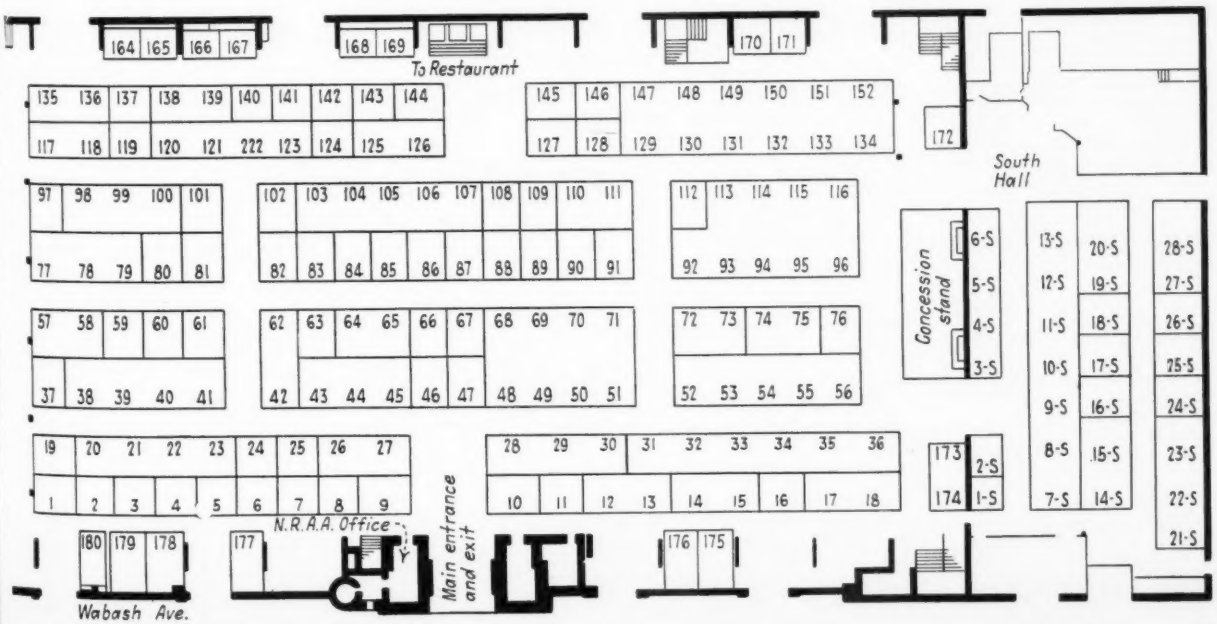
Harnischfeger Corporation, Milwaukee, Wis.—arc welders, arc-welding electrodes, crane control, electric hoists. **Space 21S-22S-23S**

Hayes Track Appliance Co., Richmond, Ind.—wheel stop, sliding derail, operating stand. **Space 145**

Hilliard Corporation, Elmira, N.Y.—lubricating and fuel-oil filters for use in connection with Diesel locomotives, oil purifiers for reclaiming Diesel-engine lubricating oil. **Space 16S**

Hobart Brothers Company and its affiliate Motor Generator Corporation, Troy, Ohio—D.C. electric motor-driven arc welders, gas-engine driven D.C. arc welders, gas-engine driven D.C. arc welders with A.C. auxiliary power generator, A.C. transformer-type welders, combination gas-engine driven A.C. arc welder and A.C. power unit, combination electric-drive arc welder and railway-car battery charger, single circuit, electric-motor driven railway-car, battery charger, gas-engine driven railway car battery charger, pedestal-type buffer and grinder. **Space 19S-20S**

Floor plan of exhibit halls at the Coliseum, Chicago, showing booth numbers



Homelite Corporation, Port Chester, N.Y.—one-man high-cycle electric chain saws in three sizes, electric paving breaker; high-cycle electric rail grinding machine, gasoline-operated generators, gasoline-operated pumps, high-cycle electric tools and floodlights, including impact wrenches, grinders, concrete vibrators and nut runners. **Space 14-15**

Hubbard and Company, Pittsburgh, Pa.—rail anchors, spring washers, track tools, spike mauls, track chisels, sledge hammers. **Space 144**

Hyman-Michaels Company, Chicago—display of rail of various weights, working model of geared locomotive. **Space 140**

Industrial Brownhoist Corporation, Bay City, Mich.—model of Diesel crane, display showing application of locomotive, Diesel, Diesel-electric, steam and gas cranes, pile drivers, car dumpers, ballast-cleaning machine, coal and ore unloaders, storage bridges, clamshell buckets. **Space 84**

Ingersoll-Rand Company, New York—spot-tamper compressor in several models and sizes, pneumatic tie tampers, spike drivers, pneumatic tools, electric impact tools. **Space 28-29-30**

International Harvester Company—Industrial Division, Chicago—tractor and mower, crawler tractor with front-end loader, crawler tractor with angle dozer. **Space 52-53-54-55-56**

Johns-Manville Sales Corporation, New York—composition pipe, asbestos wallboard, asbestos composition smoke jack, ready-to-lay roofing, asbestos shingles for roofing and siding, flooring. **Space 153-154-155-156**

O. F. Jordan Company, East Chicago, Ind.—spreader, ditcher, snow plow. **Space 86**

Joyce-Cridland Company, Dayton, Ohio—aluminum-alloy track and journal jacks, air-motor jacks, automatic lowering jacks, hydraulic jacks, locomotive screw jacks, hydraulic bus and truck jacks, standard-speed jacks. **Space 101**

Kalamazoo Manufacturing Company, Kalamazoo, Mich.—motor car with all-steel top, motor-car wheels, motor-car axles, model 27AW motor car, speed truck, engine and transmission, motorized concrete buggy. **Space 1-19**

Kay-Cee Manufacturing Company, Inc., Minneapolis, Minn. — reflective alphabets, numerals and designs. **Space 168-169**

Kershaw Company, Montgomery, Ala.—wheel-type cribbing machine, utility derrick, spike setter and distributor, crane, ballast plow and distributor, ballast regulator and dresser. **Space 1S-2S**

Koehring Company, Milwaukee, Wis.—pictures of shovels, draglines and mud-jacks, crane with propulsion car, power wheelbarrow, concrete mixer. **Space 121-122-123**

Koppers Company, Inc., Pittsburgh, Pa.—protective coatings, creosote, a new protective coating for ties, examples of pressure-treated timber for railroad application. **Space 7N-8N**

Lehon Company, Chicago—asphalt roll roofing and shingles, cold-process roofing, hot built-up asphalt roofs, waterproof felts, fabrics and papers, asphalt roof coatings, aluminum paint. **Space 128**

LeRoi Company, Milwaukee, Wis.—tractor-mounted compressor with eight tie tampers, tractor-mower with oil-bath mower head, engine, rock drills, breakers and air tools. **Space 117-118**

Locomotive Finished Material Company, Atchison, Kan.—cast-steel alloy, self-guarded frog. **Space 97**

Lufkin Rule Co., Saginaw, Mich.—measuring tapes, rules, precision tools, including chain tapes. **Space 92**

Maintenance Equipment Co., Chicago—rail and flange lubricator, reversible switch point protector, photographs of yard and main track type lubricators, photographs of power rail layer. **Space 66-67**

Mall Tool Company, Chicago—portable electric saws and drills, timber chain saws, portable track grinders, rail slotters, rail drills, flexible shaft grinders, gasoline-engine and electric-powered concrete vibrators. **Space 125-126**

Master Builders Company, Cleveland, Ohio—cement dispersing agents, plasticizing agents for concrete and mortar, membrane curing compound, non-shrink mortars, metallic hardened concrete floor finishes, rust joint iron pressure grouting machine, pre-cast signal houses. **Space 173-174**

Matisa Equipment Corporation, Chicago—movies of ballast cleaning and tamping machines in operation. **Space 188**

Midland Company, South Milwaukee, Wis.—tractor mowers with attachments, including sickle-bar mowers, lawn mowers, snow plows. **Space 3N**

Mid-West Forging & Manufacturing Co., Chicago—rail anchors. **Space 181**

Minnesota Mining & Manufacturing Co., St. Paul, Minn.—reflective sheeting, reflective fabric, ready-made reflective wayside signs and crossing signals. **Space 21N**

Modern Railroads Publishing Company, Chicago—copies of publication. **Space 172**

Morrison Railway Supply Corporation, Metalweld Process Division, Buffalo, N.Y.—photographs and literature showing the process of welding frogs and crossings, adjustable rail holders, switch-point guards, track stabilizers, welded pile shoes. **Space 3**

Murdock Manufacturing & Supply Co., Cincinnati, Ohio — water service devices, drinking fountain, air valves, check valves, Diesel-watering hydrant, hose coupling guards, street washers, car wash boxes. **Space 146**

National Aluminate Corporation, Chicago—literature on water treatment, chemical proportioning equipment and service. **Space 159-160-161-162**

National Lock Washer Company, Newark, N.J.—spring washers. **Space 72-73**

Nelson Stud Welding division of Morton Gregory Corporation, Lorain, Ohio—demonstration of welding methods, models of welded railway equipment, photographs. **Space 141**

Nichols Engineering Company, Chicago—transfer tables, turntable tractors, roller-bearing turntable trucks, motor drives. **Space 76**

Nordberg Manufacturing Company, Milwaukee, Wis.—tie adzer, rail drill, grinders, power jack, spike puller, spike hammer, track wrench, track gager, cribbing machine and set-off device, bit grinder, tension meter. **Space 3S-4S-5S-6S-7S-8S-9S-10S-11S-12S-13S**

Northwestern Motor Company, Eau Claire, Wis.—section motor car, B and B gang car, weed eradicator and ballast smoother. **Space 14S-15S**

Oliver Iron and Steel Corporation, Pittsburgh, Pa.—gage rods, tie-plate drive spikes, hold-down drive spikes, washer-head timber drive spikes, timber grips, screw spikes, track bolts, frog bolts, heel-block bolts, switch bolts, rivets, machine bolts, carriage bolts, lag bolts, water-tight bolts, cap screws, nuts. **Space 163**

D. W. Onan & Sons, Inc., Minneapolis, Minn.—engine-generator units of various sizes, portable welder, portable floodlighter, packaged-power Diesel generator units for cabooses, small AC generator units, cut-away model of 10 hp. engine. **Space 10**

Oxweld Railroad Service Company, Chicago—specimens of oxy-acetylene pressure-welded rail, slides showing the history and growth of standard rail lengths, and displays comparing the costs of continuous welded rail as compared to jointed rail. **Space 88-89**

P. & M. Co., Chicago—rail anchors. **Space 90-91**

Pettibone Mulliken Corporation, Chicago—forged-steel adjustable rail braces, spring-switch mechanism, switch stands, hydraulic retarder for spring frogs, rerailing frogs, shoulder bolts, guard rails, spring-switch compression gage, cribbing machine, tie puller and derrick, bucket loaders, under-car unloaders, conveyors, clamshell and dragline buckets, unit tie tampers. **Space 31-32-33-34-35-36**

Pittsburgh Pipe Cleaner Company, Pittsburgh, Pa.—pipe and sewer cleaning equipment. **Space 16**

Pocket List of Railroad Officials, New York—copies of Pocket List. **Space 112**

Power Ballaster Division, Pullman-Standard Car Manufacturing Company, Chicago—cribbing-machine digger head assembly, power-ballaster tamper head assembly, scale models of the power ballaster, cribbing machine and ballast cleaner, motion pictures of machines in use. **Space 9N-10N-11N-18N-19N-20N**

Pyle-National Company, Chicago—electric conduit fitting, plugs and receptacles, floodlights, rear-end warning lights. **Space 37**

Q & C Company, New York—switch-point guard, step joints, alloy and rolled-steel car stops, anti-slip rail tongs, hand-throw derail, sliding-type derail, guard rail clamps, manganese one-piece guard rail, electric switch heater, adjustable rail brace, flangeway guard brackets, gaging tools, gage rods. **Space 102**

Racine Tool & Machine Company, Racine, Wis.—portable rail saw, unit tampers, rail drill, bonding drill. **Space 57-58**

Rail Joint Company, New York—models of standard, compromise and insulated joints, insulating fiber, literature. **Space 60-61**

Railroad Accessories Corporation, New York—power track wrench, light-weight, power bonding drill. **Space 4-5**

Railroad Products Company, Cincinnati, Ohio—water columns for steam and Diesel locomotives, sanitary hydrants, switch stands. **Space 180**

Rails Company, New Haven, Conn.—compression-type rail anchors, special track construction, bridge-tie anchors, propane and kerosene switch heaters, automatic switch-point locks. **Space 127**

Railway Engineering and Maintenance, Chicago—copies of publications. **Space 109**

Railway Maintenance Corporation, Pittsburgh, Pa.—crib cleaner, ballast cleaner and excavator, rail-joint packing, literature, movies of this equipment in operation. **Space 27N-28N-29N-30N**

Railway Purchases and Stores, Chicago—copies of publication. **Space 158**

Railway Track-work Company, Philadelphia, Pa.—rail-joint cross grinder, portable stock rail grinder, power track drill, flexible shaft grinder and attachments, surface grinder. **Space 12N-13N**

Ramapo Ajax Division, American Brake Shoe Company, Chicago—switch stands, rail lubricators, tie plates, integral-base crossing, gage rod, switch, stock rails and fittings, switch stand with switch-point locks. **Space 38-39-40-41**

Reade Manufacturing Company, Jersey City, N.J.—weed killer, track liner, spike puller. **Space 8-9**

Ric-wiL Company, Cleveland, Ohio—various types of insulated piping for outside underground and overhead refrigeration piping, steam, process liquids and water piping. **Space 20-21-22-23**

Rust-Oleum Corporation, Evanston, Ill.—photos of rust preventive applications, and other practical uses. **Space 14N**

Skarnes Engineering & Supply, Inc., Minneapolis, Minn.—hydraulic-jack lift truck, including adjustable forks. **Space 11**

Sperry Rail Service, Danbury, Conn.—model of detector car, samples of defective rail, literature on rail testing and rail defects. **Space 6-7**

Taylor-Colquitt Co., Spartanburg, S.C.—animated display of the vapor-drying process, cross sections of vapor-dried and creosoted poles and ties, specimens of salt treated and vapor-dried lumber, photographs of pole-peeling machine. **Space 157**

Teleweld, Inc., Chicago—literature on service for railroads. **Space 108**

Templeton, Kenly & Co., Chicago—lift jacks, including lightweight models, rail expanders, tie spacers, track shifters, bridge jacks, jack support, utility tool, hydraulic pullers, hydraulic jacks. **Space 46-47**

Timber Engineering Company, Washington, D.C.—timber connectors, literature on connectors. **Space 171**

Thornley Railway Machine Company, Joliet, Ill.—model of track cribbing machine. **Space 170**

Unit Crane & Shovel Corp., Milwaukee, Wis.—crawler type railroad crane, self-propelled mobile cranes.
Space 31N-32N-33N-34N-35N

United Laboratories, Inc., Cleveland, Ohio—simulated platform with actual application of floor resurfacing material. Space 1N

Warsop Power Tools, Inc., Philadelphia, Pa.—self-contained portable concrete breaker, self-contained portable rock drill and various attachments for each. Space 6N

Wayer Impactor Sales Company, Columbus, Ohio—bituminous paving impactors.
Space 143

Western Railrod Supply Company, Chicago—flashing light signal and crossing gate assembly, manually-controlled electric crossing gate, bridge and pier lights, signaling and communications accessories.
Space 138-139

Western Tool & Manufacturing Co., Springfield, Ohio—circular, square, hexagon, extra length expanding mandrels, steel storage racks, grinding wheel dressers and cutters, aluminum-alloy "C" clamps, hack-saw stands.
Space 26S

White Manufacturing Company, Elkhart, Ind.—switch heaters with remote control equipment, several models of concrete vibrators and grinders, different types of kerosene torches and burners, small bituminous mixer. Space 135-136

Wisconsin Motor Corporation, Milwaukee, Wis.—three new models of four-cycle, single cylinder, air-cooled engines, two models of two-cylinder engines, cut-away model of the four-cylinder type engine. Space 17-18

Woodings-Verona Tool Works, Verona, Pa.—track tools, rail anchors, nut locks, springs. Space 64-65

Woolery Machine Company, Minneapolis, Minn—tie cutter, weed burner, flangeway cleaner, chemical sprayer. Space 119

Getting the Most from Work Equipment

(*Continued from page 263*)

submitted by all foremen, work equipment operators and work-train forces covering actual work performed, mile post locations, delays and their cause, and other pertinent data. One copy of the report is sent to the accounting department, one to the division superintendent, one to the cost group in the chief engineer's office, and a copy is retained at its source.

One of the most important purposes of this system of reporting is to make equipment performance data available currently to those responsible for the use of equipment, not only to stimulate maximum production, but to permit the application of corrective measures promptly, whenever the daily performance figures appear out of line.

Going beyond the current review of the daily reports, these reports, as received by our cost department, are summarized and recorded in report forms monthly, according to individual machines. Thus, again, those in responsible charge of machines and work operations can determine readily any questionable practices and develop ways to improve equipment performance.

"Selling" Management More Power Tools

(*Continued from page 265*)

larly if the material is factual about the economics or other advantages possible.

One chief maintenance officer with long experience makes the observation that all those in management cannot be sold in the same way. As in any business, he says, the salesman must size up his prospect correctly. He will soon know if the customer is subject to flattery or requires cold facts.

Continuing his analysis, this officer said in part, as follows:

"Some managements are receptive to any machine that will promise a satisfastory economic return, provided they are satisfied that the user will put the machine to work efficiently and secure the promised economies.

"Then there is the type in management who has heard of something of the value of labor-saving equipment and wants to get into the swim—if for no better reason than to be able to say that he has one or two of 'this or that' machines. Such in management may be sold initially, but are very difficult to resell, as they do not understand what 'this and that' were designed to do.

"Occasionally, one will encounter those in management who were sold initially, but who, upon the first indication of the need for retrenchment, will idle their machines with the excuse that they cannot afford to operate them. Such higher officers may seldom be resold because they are not convinced of the economic value of equipment, especially when retrenchments became desirable.

"Of course, there is that group in management which may have limited funds available for investment, and which does not know how to spend these funds to the best advantage. Such management may be prone to allotting the available funds to those departments which make the loudest noise."

To these classifications, another chief maintenance officer adds the classification that is not "maintenance-of-way minded"; those who cannot see the advantages of detouring trains around large mechanized gang operations in double or multiple-track territory. This officer was quick to point out that such in management present no particular problem on his road, since so many of the higher officers on his property came up through the engineering and maintenance-of-way departments, but says that, at times, when an officer in charge of a division may not be a former maintenance-of-way man, and is reluctant to see the maintenance man's problem, an appeal may be necessary to someone above him with maintenance-of-way experience.

Maintenance Men Blamed

All of these aspects of management's attitude to the contrary, there is ample evidence in the statements of those maintenance officers questioned, that, in large measure, the maintenance man, in his plea for more power tools and machines, is his own worst enemy. One of those queried observes that many maintenance officers fail to back up their requests with convincing performance or economic data, and admits that he has been at fault at times in this respect.

Seconding the comments of several others, this same officer says in effect—How can we expect to sell management more equipment if we don't use well what we already have? One principal reason given by management for not being willing to acquire more equipment is the fact that much equipment is allowed to remain idle or is not used to capacity. To the extent that this idleness or inefficiency is caused by inadequate or inefficient planning, inadequate maintenance and repair of the equipment, or lack of proper supervision to keep the equipment in efficient operation, he says, maintenance men are defeating their own ends, and can't expect management to be favorable to their requests for more equipment. Condemning his own group, he continues, "It is surprising how many maintenance men are guilty of reluctantly grasping the full opporunities afforded by power equipment."

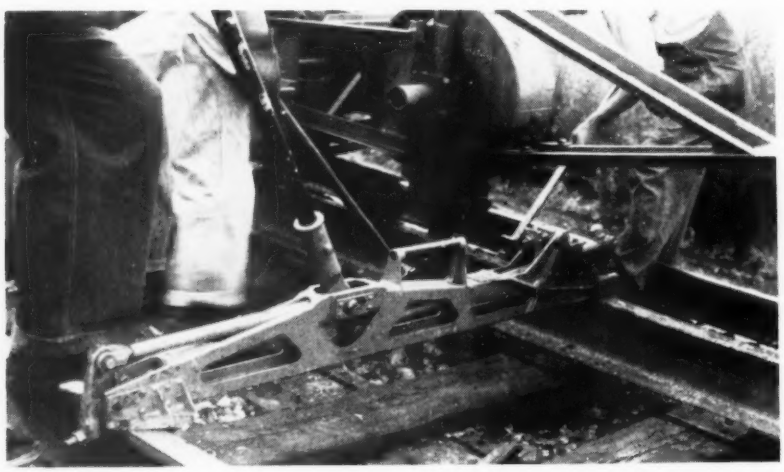
All those commenting on this subject—while admitting shortcomings on their own part, and on the part of maintenance officers generally—agree that there was never greater need for the mechanization of the maintenance-of-way and structures operations than there is today; that, where necessary, management must be sold to still further mechanization; and that it is up to maintenance officers themselves—indeed their responsibility to their respective roads—to do this selling, employing all the strategy of good salemanship to that end.

March of Machines

Presented in these pages is a brief and graphic summary of most of the new and improved equipment described in this publication during the past year

Above—A Simplex universal track jack, No. 15A, embodying a number of improvements as a result of which three track maintenance operations—tamping, surfacing and lining—can all be accomplished with the one jack. *Templeton, Kenly & Co.*

Below—The Trakgager—a tool for bringing track rails to gage and holding them in position for spiking. Intended primarily for use with the Nordberg spike driver by a gaging team of four men. *Nordberg Manufacturing Company*

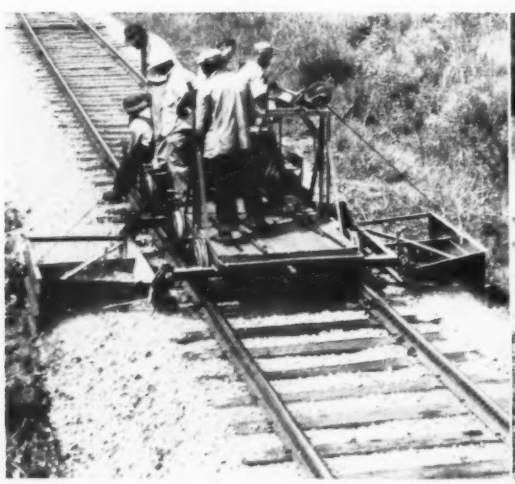


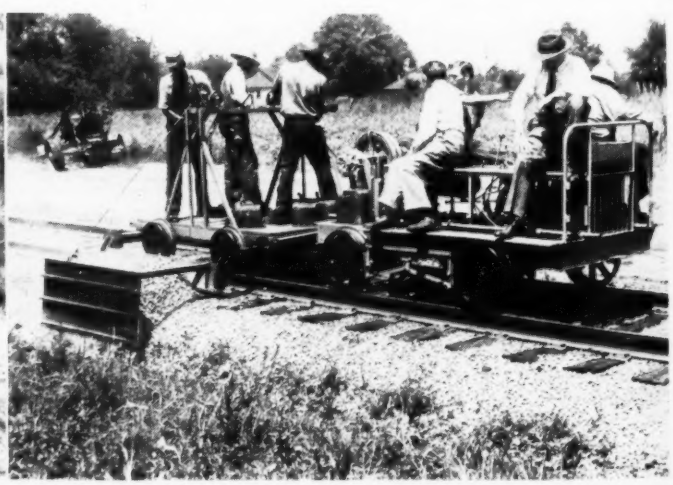
Below—Two views of a ballast regulator and dresser consisting of two drag-type wings mounted on a heavy-duty push car. The unit is pulled by a heavy-duty motor car and is recommended for section-gang use. Each wing is equipped with scarifying teeth. The push-car unit can be turned off the track at a highway crossing by four men. It is claimed that with this machine a section gang can regulate, scarify and dress approximately five to six miles of track per day. *The Kershaw Company*

• In keeping with the Equipment Economies theme that keynotes this entire issue, no greater service could be rendered our readers than to refresh their minds in regard to the many new and improved machines, power tools and devices, introduced by manufacturers during the last 12 months, which are designed to make railway maintenance work easier, safer and cheaper. Accordingly, for the third successive year, *Railway Engineering and Maintenance* in these seven pages, reviews, briefly and graphically, much of the new equipment which has previously been described in greater detail in the issues from April, 1948, to February, 1949, inclusive.

During this period the number of new and improved machines introduced was in keeping with the high rate of activity that has been in evidence since the end of the war. In studying the March of Machines

For additional information on any of the products described on these pages, use postcards, page 219



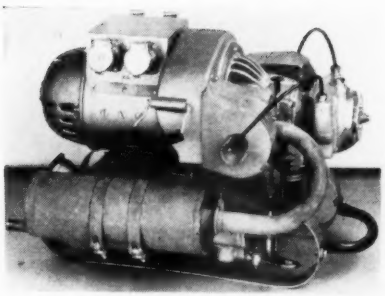


—A Review

the reader will be impressed with the great variety of equipment that is portrayed; units for use in virtually every phase of railway maintenance are included. This great variety gives evidence of the manufacturers' efforts to anticipate needs in all types of work and then to construct machines, that will meet them satisfactorily. In design the equipment incorporates the latest ideas in engineering and technology to increase service life and efficiency, and to reduce maintenance and operating costs. Extensive use has been made, where practicable, of aluminum-alloy to reduce weight.

Because of space limitations and in the interest of conserving readers' time the presentations have been limited to pictures and brief captions. Due to lack of space it has not been possible to present quite all the deserving products that were introduced during the last year.

As further evidence that the manufacturers are continuing their efforts to fulfill the needs of railways for new and better equipment, readers need only glance at the Products of Manufacturers section of this issue, in which many additional devices are described for the first time.

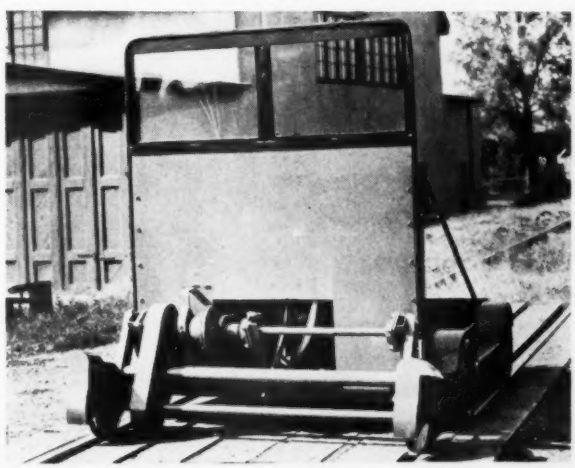


Above—A portable, dual-purpose generator that can be used to operate either high-cycle electric tools or standard universal electric tools and floodlights. Driven by a Homelite air-cooled gasoline engine. *The Homelite Corporation*

Right—Pneumatic tie-tamping tool, Model MT-4, reported to use 40 per cent less air for operation than its predecessor, the Model MT-3, thus permitting use of a greater number of tools with any given compressor. *Ingersoll-Rand Company*

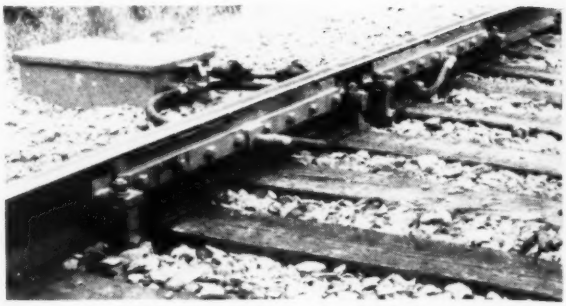
Above—Improved oil sprayer designed to handle water-base liquids in addition to oil. As a result it can be used for applying weed killers to the roadbed as well as for pressure spraying of angle bars and other track accessories with oil. *Fairmont Railway Motors, Inc.*

Below—Off track, power-operated unit for cleaning snow and ice from flangeways at highway-railway grade crossings. Ice and snow removal is accomplished by a circular cutter with four cutting blades, V-belt driven by a 4-h.p. air-cooled engine. *Woolery Machine Company*



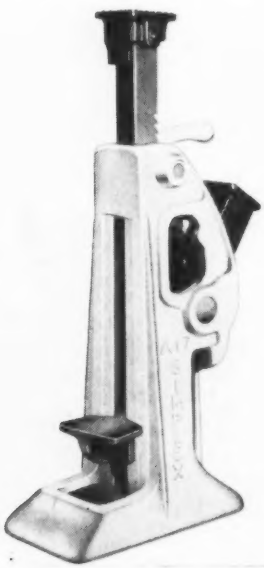
Below—A self-propelled, on-track machine, Model 300, for cleaning flangeways at highway-railway grade crossings. It consists of a flangeway cleaner attachment composed of two circular cutters, mounted on the front of a section-crew size motor car. *Woolery Machine Company*

March of Machines—

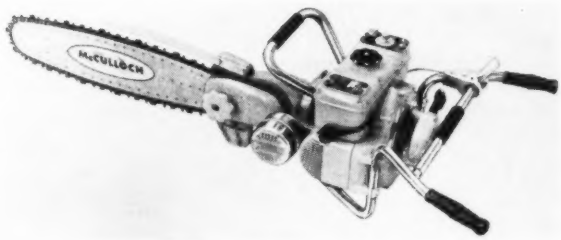


Left—Rail drill, No. P-43, incorporating improvements designed to speed drilling operations and thereby reduce costs. Power is supplied by a 1½-hp. gasoline engine through an adjustable V-belt. *Railway Track-work Company*

Above — Meco Type MBJ rail and flange lubricator. Features include adjustable lubricant wiping bars, machined lubricant passages, easy servicing, and less frequent chargings of grease. *Maintenance Equipment Co.*



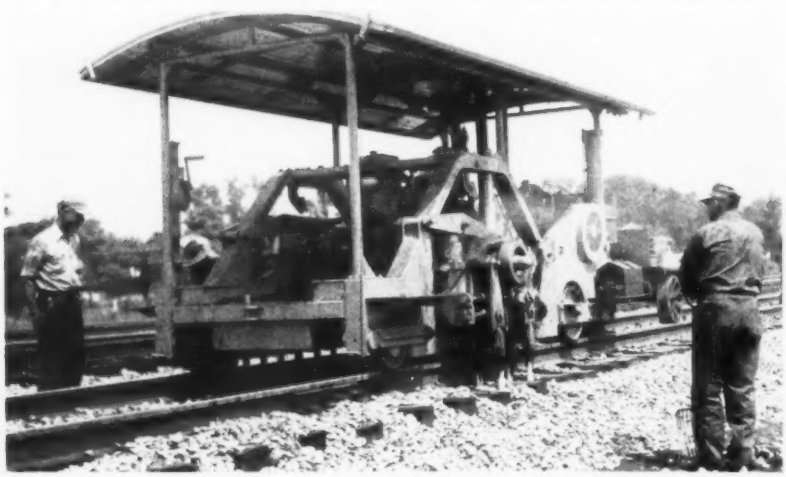
Right—A lightweight chain saw with all-purpose chain for either ripping or cross cutting. Driven by 5-hp., 2-cycle McCulloch engine with beveled-gear transmission. *The McCulloch Motors Corporation*

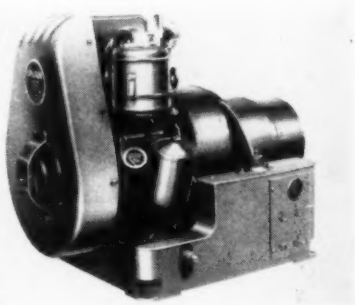


Above—Simplex track jack, No. A17, provided with aluminum-alloy housing for lighter weight and easy handling. Jack weighs 41½ lb. and has a lifting capacity of 15 tons. It is 22¾ in. high and has a 13-in. lift. *Templeton, Kenly & Co.*

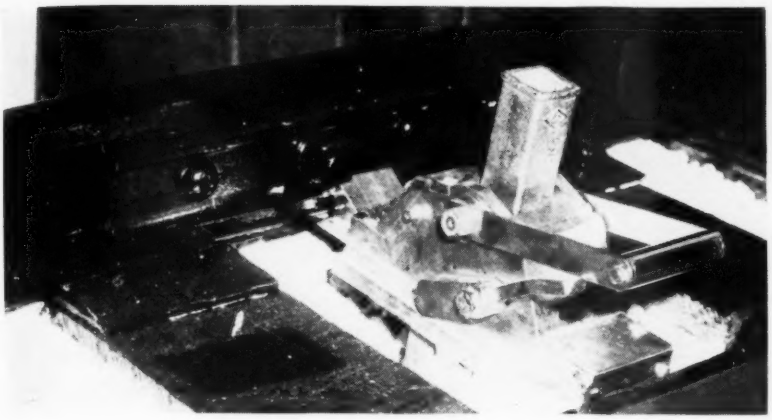
Below—On-track tamping machine. Can be operated by one man. Tamping is done by a combination of compression and vibratory actions. Machine is said to tamp from 350 to 500 ft. of track per hour. *Matisa Equipment Corporation*

Above—Mocar-Crane for laying rail. For use on heavy-duty motor cars. Crane attachment has capacity of 2,000 lb., a 22-ft. boom and a 6.1-hp. Wisconsin engine, and can be removed from the track by hand. *The Kershaw Company*



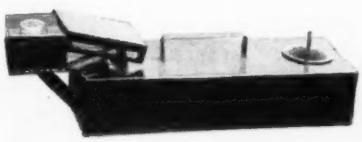


Above—Air-cooled Diesel-electric plant said to be unusually compact and light in weight. Available in either alternating or direct-current models of 2,500-watt capacities. *D. W. Onan & Sons, Inc.*



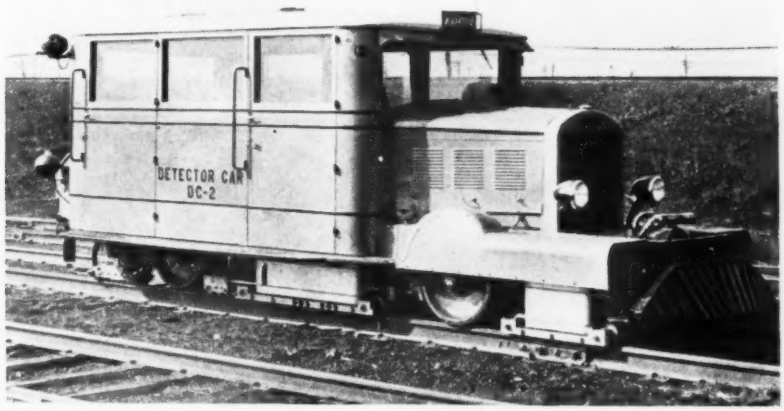
Above—Track lining tool which is said to shift track without causing it to "hump." See page 294 this issue for description of improved model. *Reade Mfg. Co.*

Below—Lightweight air-powered generator for lighting purposes, which can be used for illuminating night work in any situation requiring the operation of an air compressor. It will supply enough current for two 75-watt, 110 or 220-volt light bulbs. *Ingersoll-Rand Co.*

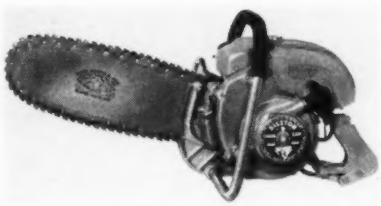


Above—Pot-type switch heater, Type D, said to have the advantages of small size, long burning, low fuel consumption, better combustion. *The Rails Company*

Below—Lightweight, one-man chain saw said to operate with equal efficiency in any cutting position. Powered by 3½-hp. engine. *Henry Disston & Sons, Inc.*



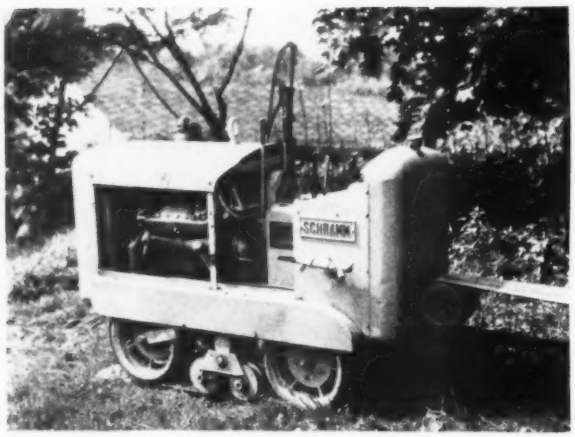
Below—Rail flaw detector car. Operates at testing speed of 7 m.p.h. and is said to be capable of covering 15 to 25 mi. of track per day. *Teleweld, Inc.*



Below — Hand-operated derrick developed primarily for use by small rail gangs in removing from the track, equipment used in rail-relaying work. Using this derrick, it is said that rail relaying equipment can be removed from the track at a rate of one piece per minute. Also adapted for use by bridge gangs in handling timbers. *Kershaw Company*

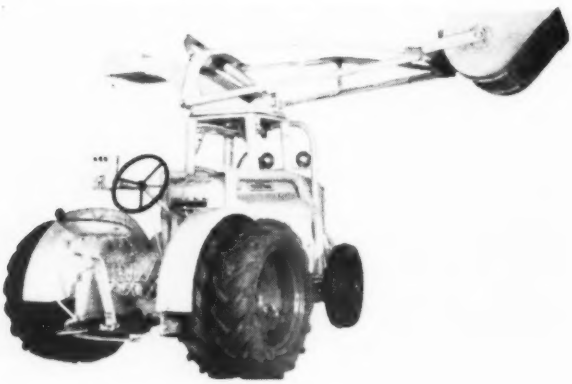
Above — Compact, air-cooled, 2-cycle gasoline engine that develops 4 hp. at an engine speed of 4,500 r.p.m. Has a 2-in. bore and 2-in. stroke, and weighs only 30 lb. Designed for application to such portable units as saws, compressors, generators, pumps and conveyers. Features include die-cast aluminum parts, anti-friction bearings, and diaphragm carburetor. *Reed-Prentice Corp.*

March of Machines—

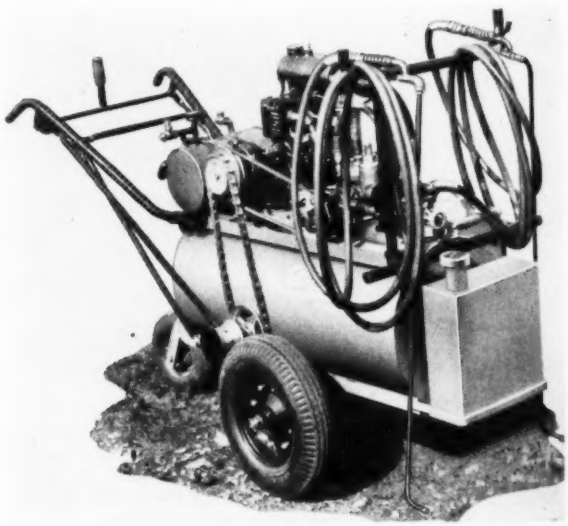


Above—Power take-off for Schramm Model 60 crawler compressor. Available in either straight splined-shaft type or right-angle belt type. Rated at 10 hp. at 2,200 r.p.m. *Schramm, Inc.*

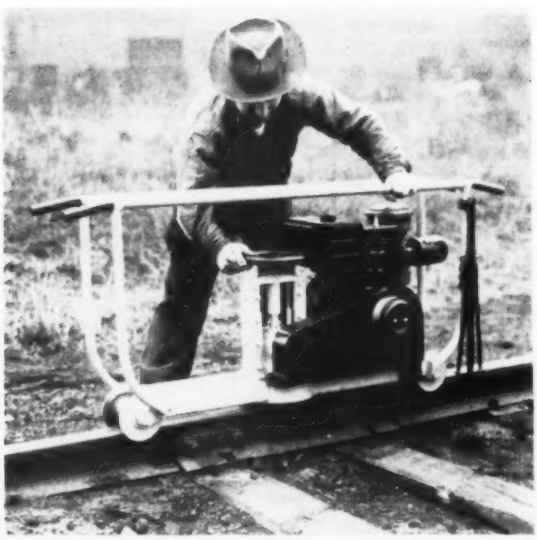
Above—Aluminum cab designed for use on Fairmont M9 and M19 inspection motor cars. Reported to be durable as well as light in weight. Cab extends over wheel guards and has side panels, giving good protection. *Fairmont Railway Motors, Inc.*



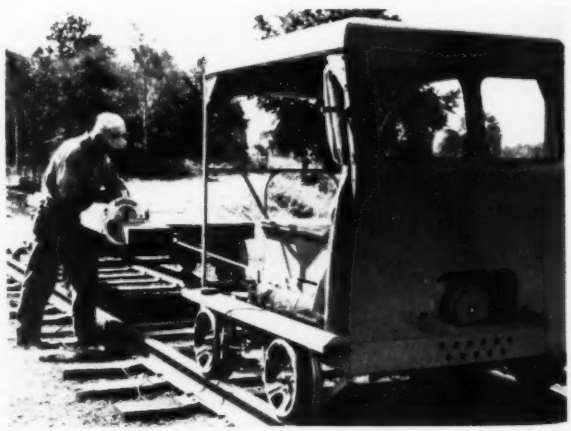
Above — Hydraulically-operated, heavy-duty industrial type loader having a load capacity of 1,200 lb. For application to the LeRoi 105 Tractair. *LeRoi Company*



Right—Off-track unit designed for spraying rail joints in track with heavier grades of oil to reduce the number of oil applications required. *Woolery Machine Company*

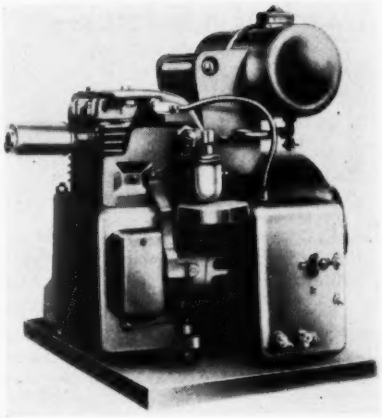


Left—Portable, one-man cup-wheel grinder, Model P-45, for grinding welded rail ends. *Railway Track-work Company*

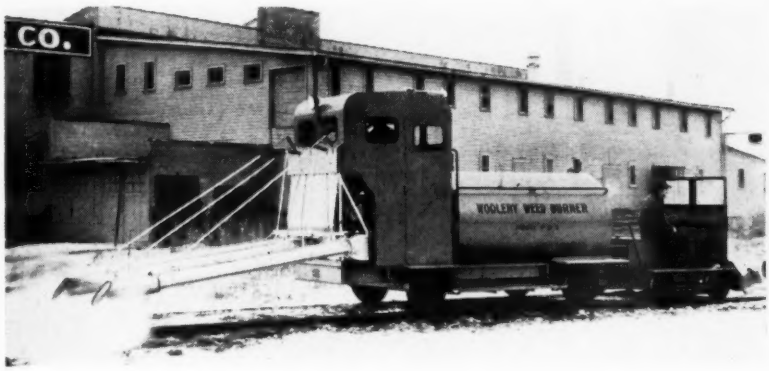


Above—Motor car with generator. For use as section car or power source for electric tools. *Kalamazoo Mfg. Co.*

Left—Two-man, 12-hp. chain saw for heavy-duty timber cutting and for sawing wet, frozen, or hard wood. *Henry Disston & Sons, Inc.*

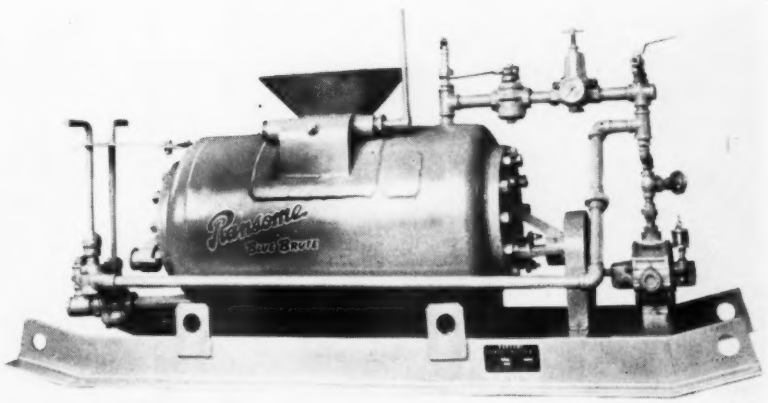


Above—Portable electric power plant, one of a series known as AAE models, which weighs only 77 lb. and occupies less than 2 cu. ft. of space. Powered by four-cycle, air-cooled gasoline engine. *D. W. Onan & Sons, Inc.*

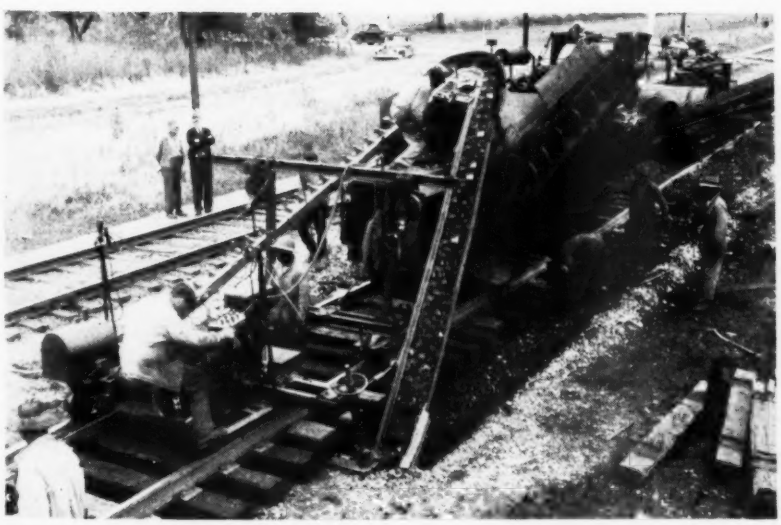


Above—Switch thawer and weed burner. On-track unit consisting of a chassis of 8-in. channel-steel, on which is mounted a cab and a 1,000-gal. fuel-oil tank. *Woolery Machine Company*

Below—Lifting magnet featuring new type of welded construction which is said to prolong the life of the magnet. *Ohio Electric Manufacturing Company*



Above—Blue Brute grout mixer-ejector designed to meet the specialized requirements of railway roadbed-grouting operations. Completely air-operated. *Ransome Machinery Company, subsidiary of Worthington Pump & Machinery Corp.*



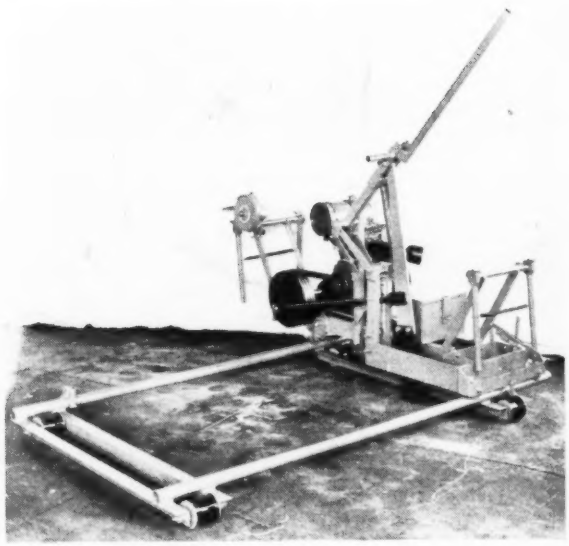
Below—On-track, self-propelled ballast cleaner. Said to clean from 150 to 240 lin. ft. of track an hour, and to renovate the entire ballast section, continuously beneath the ties, to any depth up to 36 in. *Matisa Equipment Corp.*

Above—Ball-bearing screw jack, called the "Shorty," for lifting low-set loads. The unit is 7 in. high, weighs only 22 lb., and has a capacity of 15 tons. It is operated by a 36-in. pinch-bar lever. *The Duff-Norton Manufacturing Company*

March of Machines—

Above—Tempotool "38," a tool which utilizes a powder explosion to drive a "holding stud." *Tempo Products Company*

Right—Concrete breaker, the Thor "24," for work just under heavy-duty class. *The Independent Pneumatic Tool Company*



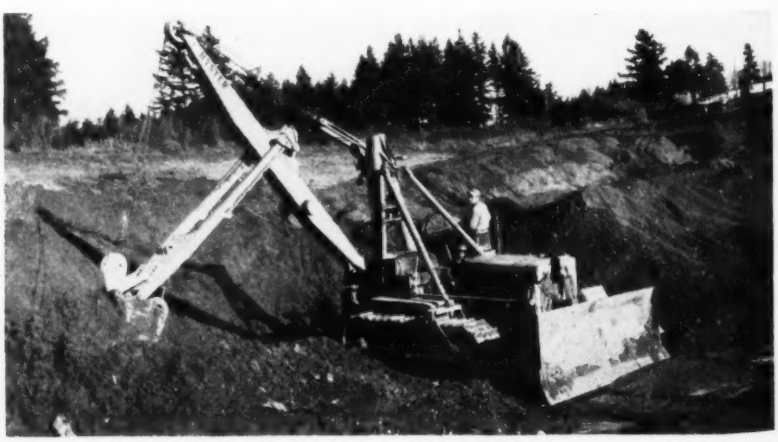
Right—Model N tie cutter with cutter which can be moved transversely across the track. *Woolery Machine Company*

Above—A tool for shipping or peening welds. It is small in size and light in weight, and is reported as being highly suitable for use in confined spaces such as on the inside of small tanks. It is 10 in. long and weighs 4 lb. *Chicago Pneumatic Tool Company*

Above—Simplex Cramer-type push-and-pull jack for lining piles and for other types of push-and-pull jacking work. Two stock models are available—Model 5 and Model 6. The former extends from 11 in. to 17 in.; the latter from 18 in. to 30 in. *Templeton, Kenly & Co.*

Below — Shovel attachment developed (along with a hoe attachment) for application to the Hystaway unit (as mounted on Caterpillar crawler tractors). Shovel and hoe, with capacities of about ½ yd., may be used on Caterpillar D8 and D7 tractors. *Hyster Co.*

Above—Portable electric ½-in. drill, known as the Thor "Silver Line," featuring high power with light weight, and an improved ventilating system. *The Independent Pneumatic Tool Company*



PRODUCTS OF MANUFACTURERS

New, improved equipment, materials, devices

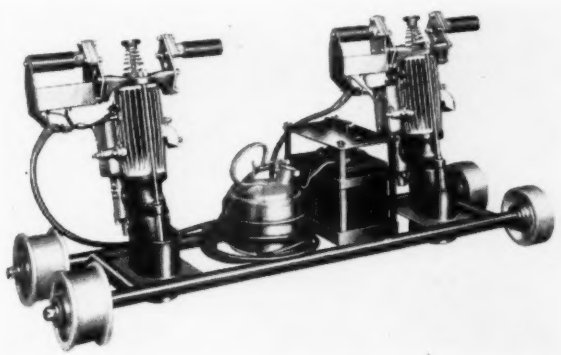
(For additional information on any of the products described in these columns, use postcards, page 219)

BARCO ITEMS IMPROVED

A NUMBER of improvements in its gasoline spike driver and its spike-driver carriage have been announced by the Barco Manufacturing Company, Chicago. The spike driver has been equipped with a redesigned gasoline tank which does not obstruct the vision of the operator while he is driving spikes from either side of the driver, and which provides additional vertical clearance to facilitate driving of spikes along the higher track rails now being used.

The improved Barco gasoline spike driver

The spike-driver carriage has been completely redesigned so that it can carry two spike drivers along with the battery and fuel supply. The entire arrangement can be quickly cleared from the track by pulling the cable plugs from the battery, removing the spike drivers, and then lifting off the carriage. This operation can be handled by either one or two men.



The Barco spike driver carriage now accommodates two drivers

POWER SICKLE MOWER

FAIRMONT Railway Motors, Inc., Fairmont, Minn., has introduced a power sickle mower, known as W76 Series A, which is a two-wheel, self-propelled unit that can be used between track rails, on roadbed shoulders, around stations and in yards. Power for the sickle and both wheels is supplied by a single-cylinder, four-cycle, air-cooled engine through an enclosed reduction gear. The operation of the unit is controlled by three dry disc clutches, one for each wheel and one for the sickle. The final drive for each wheel is by sprockets and roller chain.

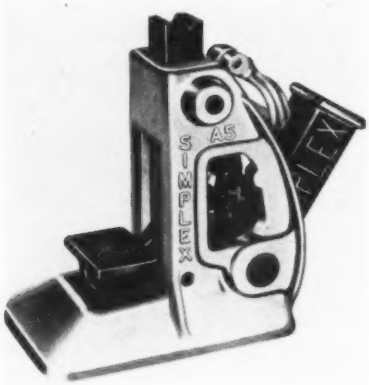
The drive for the sickle includes a counterbalanced drive wheel, pitman, vertical shaft and driving link. The cutter bar has 18 guards and the sickle 17 full sections. All bearings have grease lubricated Oilite bushings. The height of the finished cut

The Fairmont W76 Series A power sickle mower

can be adjusted from 2 to 5 in. from the ground. The width of the cut is 42½ in.

ALUMINUM-ALLOY THREE-PURPOSE JACK

TEMPLETON, Kenly & Co., Chicago, is introducing the Simplex No. A5 track jack, a universal model constructed of aluminum alloy, which can be used for three different track-maintenance operations—namely, tamping, surfacing and lining. Weighing only 26 lb., the A5 jack is 15 lb. lighter than its malleable-iron predecessor, the No. 15A, yet retains all the improvements in design incorporated in the latter.



The Simplex A5 aluminum alloy track jack

These improvements include: (1) a pawl and socket designed for low maintenance; (2) a short fulcrum center for easier lifting; (3) a safety thumb guard for greater safety to the operator; (4) a larger striking surface for increasing the surface lift of the jack; and (5) an enlarged toe lift of 2½ in. by 3¼ in., which, it is said, permits lifting at the ends of ties without tie cutting. The jack has a capacity of 15 tons. It is 11 in. high and has a 5-in. lift.

RACOR SWITCH STAND

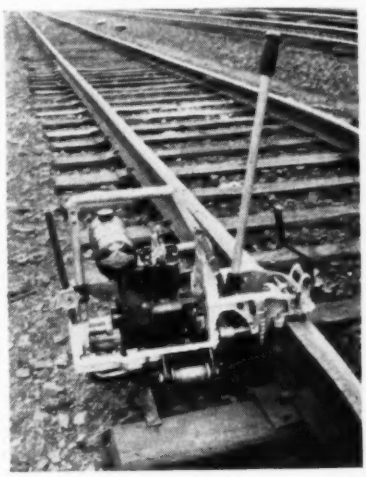
THE American Brake Shoe Company, Ramapo Ajax Division, Chicago, has developed a heavy-duty, adjustable switch stand, known as the Racor Style 22, which can be used for either automatic or hand-throw operation. It is designed for use on busy yard ladders and other switching turnouts that are run through frequently. The new switch stand has a linkage or toggle which, it is said, eliminates bearing friction during automatic operation, yet insures completion of throw of partially trailed switches; an adjustable crank eye, 1¾ in. in diameter, to provide ample adjustment to fit the throw of the switches; an over-sized spring which is amply strong to hold the switch points against the stock rails; and a standard lever and weight for hand-throw operation.

In automatic operation, when a switch is run through, the action of the wheels on the points revolves the spindle against the pressure of the spring until the mid-point of the switch is passed, after which the spring forces the spindle to complete the revolution, thus leaving the switch in the reverse position. If the train reverses direction before the mid-point is reached, the spring forces the switch back to its original position. During the automatic operation the hand lever remains fixed.

During hand-throw operation the spring is not engaged except for slight compression at each end of throw to supply the pressure necessary to maintain the position of the switch against the stock rail. The switch target and lamp tip move with the switch whether hand thrown or automatically thrown. Thus the position of the switch is always indicated.

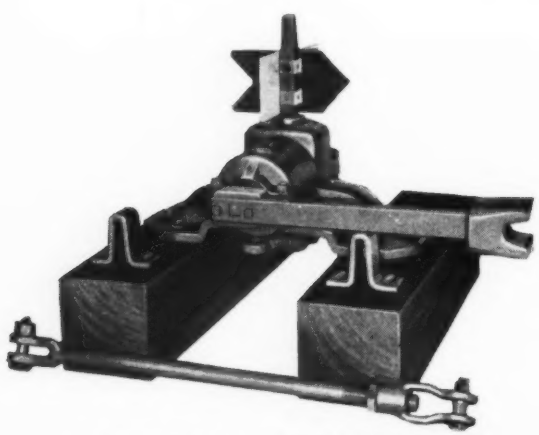
RACO POWER BONDING DRILL

THE Railroad Accessories Corporation, New York, is offering a new power drill, known as Model No. 575-1, for drilling rails when applying track-circuit bonds. It is powered by a B. & S. air-cooled gasoline engine (1.6 hp.) through a self-contained reduction gear. Drilling speed of the bit is controlled by a hand throttle.

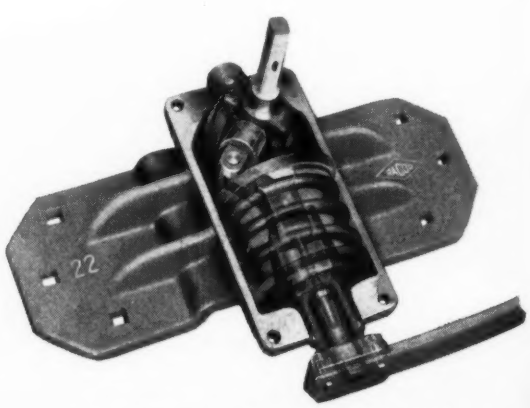


The Raco power bonding drill, Model No. 575-1

When in operation the drilling end of the machine is fastened securely



The Racor Style 22 automatic switch stand



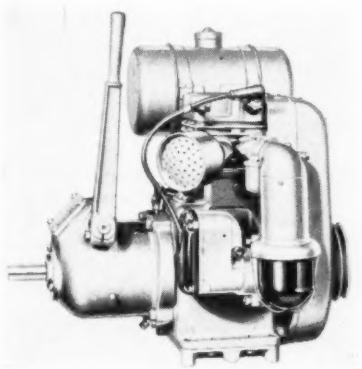
Cut-away view of the new switch stand

to the rail by a simple clamp, while the engine end is supported on the tie ends by an adjustable foot. In moving the machine from joint to joint, it is guided along the top of the rail on two ball-bearing rollers.

Other features of the machine include a special collet chuck in which standard ⅜-in. bonding bits are said to be easily installed and removed and which automatically centers them when they are installed; a permanently sealed new departure ball thrust bearing on the engine shaft, which needs no lubrication; a gage placed near the bit in full view of the operator for proper locating and spacing of holes; and a built-in protected level to insure proper drilling angle. All the adjusting nuts of the machine are fitted by one special wrench. The drill weighs 80 lb.

THREE NEW MODELS OF WISCONSIN ENGINES

THE Wisconsin Motors Corporation, Milwaukee, Wis., is introducing three new four-cycle, single-cylinder, air-cooled engines which feature greater power without increase in engine weight or sacrifice of service-



One of the new Wisconsin engines with clutch assembly

ability. The first of the new models, designated as the ABN, is rated at 4 hp. and weighs 76 lb.; the second, the 5-hp. AKN, weighs 77 lb.; and the third, the AEN, has a capacity of 7½ hp. and a weight of 110 lb. The latter model has 20 per cent more power than its predecessor, yet weighs appreciably less.

Each of the engines has tapered roller bearings at both ends of the drop-forged crankshaft; a large-capacity flywheel fan that is said to provide continuous, dependable engine cooling; and a weather-sealed high-tension outside magneto, with impulse coupling, which is reported to assure quick, easy starting and smooth running in any climate, at all temperatures.

For additional information on any of the products described on these pages, use postcards, page 219

Grinding rail ends with the Homelite high-cycle rail grinder

HIGH-CYCLE ELECTRIC GRINDER

THE Homelite Corporation, Port Chester, N. Y., has developed a high-cycle electric rail grinder for resurfacing rail ends after welding, which features simple construction and light weight. The machine consists of a high-cycle electric motor and grinding wheel mounted in a tubular-steel frame which rides the track rail on two rollers. The grinder is fed by a screw which is controlled by a handle at the top of the machine.

Using this machine an exceptionally smooth rail surface can be obtained, it is reported, because the screw feed permits a very close adjustment of the grinding level, and because the operating characteristics of the high-cycle grinder are said to assure a uniform grinding speed even under heavy loads. The entire unit weighs 95 lb. and can be operated and removed from the track by one man.

PNEUMATIC GROUTER

A NEW pneumatic grouting machine is being offered by Robert S. Mayo, civil engineer of Lancaster, Pa. This unit, which has a capacity of 3½ cu. ft., is designed for working pressures of approximately 100 p.s.i. and embodies a pressure chamber fitted with valves and pipes for admitting compressed air and for discharging the grout. There are no moving parts.

A feature of the machine is the charging door which swings out of the way for charging operations. Another feature is the use of compressed air to agitate the charge and thus mix the grout. This is accomplished through an agitator valve which admits air into the bottom of the pressure chamber, thus "boiling" the charge and mixing the grout.

In operating the grouter, it is first charged with the proper amount of water after which the agitator valve

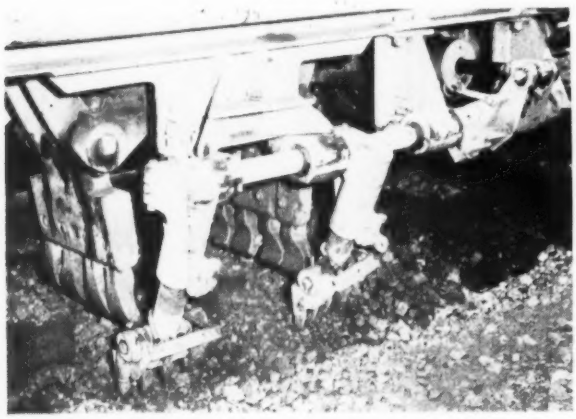
The Mayo pneumatic grouter

is opened to agitate the water while the cement and sand are poured in. The charging door is then closed and air pressure is applied on top of the charge. The discharge valve is then opened to empty the machine. The Mayo grouter is of welded construction and is tested at 200 p.s.i. The charging height of the unit is 36 in.

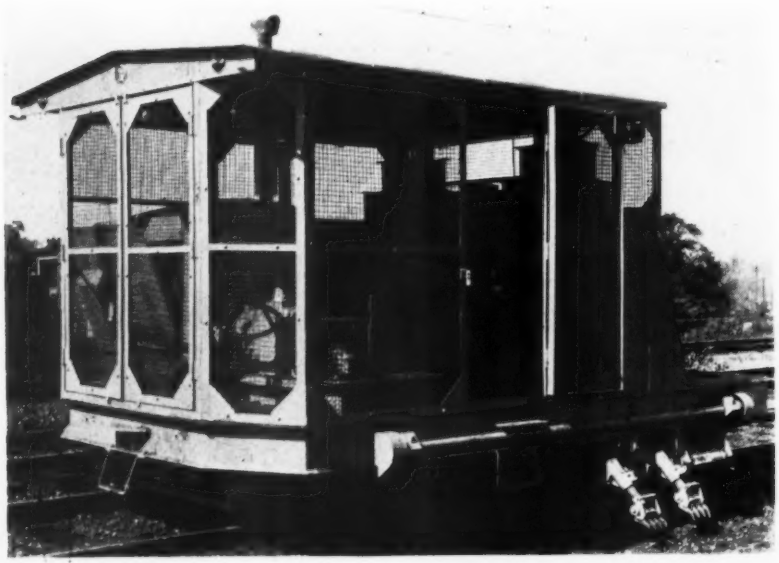
BALLAST FEEDERS FOR POWER BALLASTER

THE Pullman-Standard Car Manufacturing Company, Power Ballaster Division, Chicago, has added to its Power Ballaster an automatic ballast-feeding attachment which is said to eliminate all need of hand feeding. This attachment consists of two pairs of ballast forks, one pair on each side of the machine adjacent to the main tamping shoes. The motion of the forks is synchronized with the action of the main tamping shoes in such a way that, as the latter approach the tie base, the forks kick inwardly, raking ballast from the track shoulder into the crib.

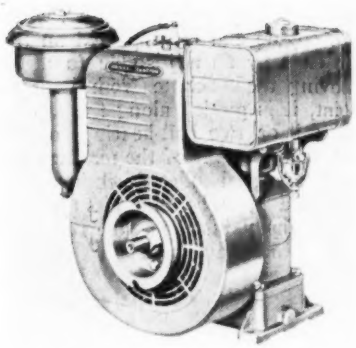
The control mechanism of the forks is so designed that the forks operate only when additional ballast is needed, thus providing it is said, a more uniform feeding than is possible by hand labor. Because laborers are not needed in intertrack spaces, the Power Ballaster with the ballast-feeder attachment can operate continuously in multiple-track territory regardless of passing trains on adjacent tracks. The attachment is included on all new models and can be easily added to Power Ballasters now in service.



Close-up view of the ballast feeder forking ballast into track cribs



A Power Ballaster with the new ballast-feeding attachment



One of the new Briggs & Stratton engines

THREE NEW ENGINES BY BRIGGS & STRATTON

THE Briggs & Stratton Corporation, Milwaukee, Wis., has added three new models to its line of four-cycle, air-cooled gasoline engines. These are the Model "9", rated at 2.16 to 3.1 hp.; the Model "14", 3.56 to 5.1 hp.; and the Model "23", 6.5 to 8.25 hp. One of the features of the new models is the Briggs & Stratton Magnematic ignition system, consisting of a breaker box unit, externally mounted on the crankcase, in which is enclosed adjustable breaker points, a condenser, and manual and remote stop switch terminals. This system is said to produce a high voltage at low speeds and incorporates an automatic spark retard and advance, assuring, it is said, quick easy starting.

Other features of the engines include a choice of either plain or ball main bearings, an enclosed adjustable governor, operating in oil, a new vacuum breather and spring-loaded oil seals that prevent oil leaks, and a snap-on oil filler cap that eliminates the need for a wrench when adding or changing oil. For starting one of these engines, a starter rope or a hand crank, or both, can be furnished.

SOIL COMPACTOR

THE Barco Manufacturing Company, Chicago, has developed a portable gasoline-powered rammer, known as the Model BR-2, for compacting soils in places that cannot be reached by rollers. The rammer consists essentially of a cylinder with a piston fitted at its lower end with a tamping foot 9½ in. in diameter. The operator's handles are at the upper end of the cylinder. The unit is entirely self-contained, the ignition being supplied by a magneto.

Lubrication is obtained by mixing oil with the gasoline.

The rammer is put in operation by pushing down on the handles, thus actuating the ignition. The piston is forced down sharply causing a recoil action that lifts the entire unit vertically off the ground, after which it drops by its own weight, producing, thereby, a ramming action. The speed of operation is controlled by the operator, the usual rate being 50 to 60 jumps per minute. The weight of the rammer is 210 lb., and the height of the jump and drop is sufficient to produce the desired compaction. The rammer is moved forward, backward and sideways over the area to be tamped by tipping the machine slightly. It may be moved from place to place also by the same means. The operator performs no manual labor except pushing down the handles and, therefore, continuous operation may be carried on.

Tamping near a bridge abutment with the Barco Model BR-2 rammer

IMPROVED McWILLIAMS CRIB CLEANER MACHINE

THE Railway Maintenance Corporation, Pittsburgh, Pa., has announced an improved model of its McWilliams crib-cleaning machine, an on-track self-propelled car which can be used either for crib excavating and ballast cleaning or, if desired, for crib excavating only.

When used for cleaning ballast, the rams of the machine force the ballast from the ends of the ties to a position betwen the rails, where it is picked up by an endless, digging-bucket-type conveyor. The conveyor delivers the ballast to vibrating screens for separation of dirt and ballast, after which the cleaned ballast is returned to the track both inside and outside the rails, and the separated dirt is delivered by a conveyor to the side of the roadbed, 7 ft. from the center line of the track. The latter conveyor, operating across the machine at right angles to the track, is reversible, thus permitting delivery of the dirt to either side of the track. When it is desired to deliver the dirt across an adjacent track, or a greater distance from the track being worked, a 16-ft. swing conveyor is provided, which, when not in use, folds alongside the machine in the clear.

To convert the machine from a ballast cleaner to a crib excavator, it is necessary only to remove the screens, a change that can be made in a few minutes. When this is done all the materials excavated from the cribs are deposited at the side of the roadbed.

The dimensions of the machine are such that it can be operated without fouling an adjacent track. The power plant is a 75-hp. Diesel or gasoline engine, direct connected to a hydraulic pump. All operations of the machine, including propulsion, are hydraulically operated by the pump except the mechanical drive of the digging excavator conveyor.

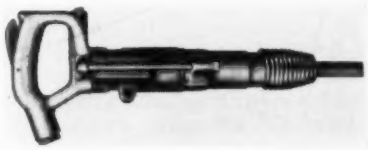
The unit can travel at speeds ranging from 5 to 18 m.p.h. and is equipped with air, hydraulic and hand brakes. All operations are controlled from one location and only one man is required. According to the manufacturer the operating cycle of the machine is such that a crib is cleaned in 20 sec.

Cleaning ballast with the improved McWilliams crib cleaner

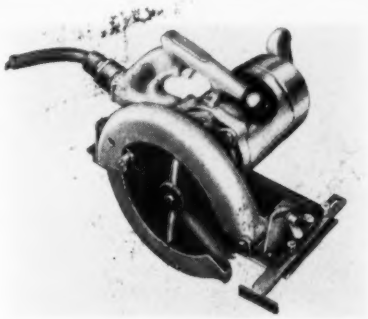
For additional information on any of the products described on these pages, use postcards, page 219

SINKER DRILL— ELECTRIC SAWS

THE Chicago Pneumatic Tool Company, New York, is now offering, for railway maintenance and construction work, a number of new power-operated tools, including a small 14-lb. pneumatic sinker drill and a line of electric saws. The sinker drill is a self-rotating tool for drilling in concrete, stone, masonry and other hard substances. Because of its light weight, it can be used for overhead work, operating from lad-



The Chicago Pneumatic sinker drill

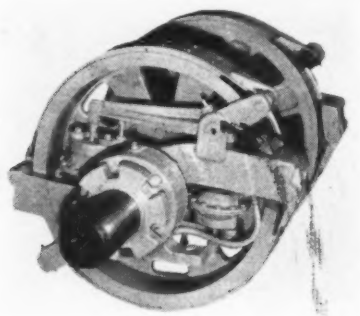


One of the new Chicago Pneumatic electric saws

ders or scaffolds. It can also be used for light chipping and scaling. The electric saws are designed for fast, heavy-duty cutting. Their motors, with helical gearing, operate on 110-volt current.

NEW CLUTCH FOR "AMERICAN" CRANES

AFTER several years of research and experiments, the American Hoist & Derrick Co., St. Paul, Minn., has developed a new standard clutch for swinging and traveling on "American" locomotive cranes. The new clutch retains the desirable features of the outside-band-type clutch (simplicity, efficiency and ease of replacing lining) while, it is said, overcoming its principle objection, that of keeping the band perfectly



The "American" double tandem clutch

round so that its full surface contacts the drum.

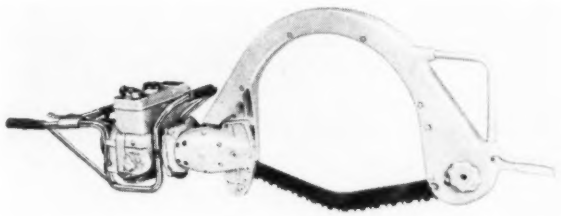
This has been done by using a double tandem clutch which consists of two half bands, rather than one full band encircling the entire drum. Each half band is actuated by a separate air cylinder, both air cylinders being controlled by a single valve. With these half bands it is said to be a simple matter to keep the entire band surface in contact with the drum, thus avoiding high spots and jerky operation.

McCULLOCH 20-IN. BOW SAW

THE McCulloch Motors Corporation, Los Angeles, Cal., is introducing a 20-in. bow saw designed to cut timbers, lying in any position, without pinching, prying or wedging. It is said to cut rapidly through any kind of wood whether lying flat on the ground, propped at one or both ends, or swinging. The bow is a rigid aluminum-alloy casting which holds down the weight of the saw to 6.3 lb. The chain track and blade are made of tool steel and either can be replaced easily, if necessary.

Power is supplied by the same 5-hp. engine used in other McCulloch chain saws, and the bow can be interchanged with any length of straight blade and chain up to 5 ft. in length. All the features of the

The McCulloch bow saw

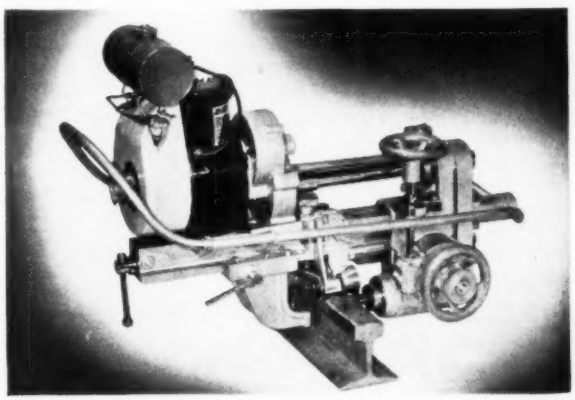


McCulloch chain saw are incorporated in the bow model, viz., 360-deg. swiveling, automatic clutch, automatic control of chain tension, kick-proof starter, fast-starting magneto, operation of the engine in any position, and the all-purpose chain for either ripping or cross cutting.

PORTABLE RAIL DRILL

THE Racine Tool & Machine Co., Racine, Wis., has developed a one-man power rail drill designed to speed and simplify the job of drilling rail in track. In appearance and operation the unit resembles a drill press placed in a horizontal instead of a

The Racine one-man power rail drill

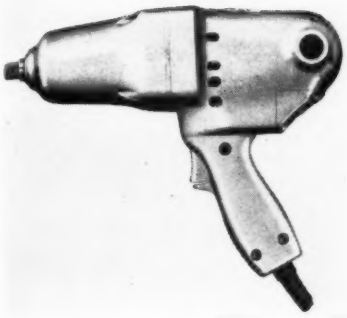


vertical position. It is rolled along the rail balanced on wheels placed at the center of a horizontal shaft on which is mounted at one end the drill head and at the other end the rail clamp and the power unit. One man can move the drill along the rail and, when necessary, lift it from the track or onto a motor car.

The power unit is a 2-hp. gasoline engine which drives the drill chuck through a reduction gear having a ratio of 30 to 1. The drilling assembly contains a power feeding unit which can be set to develop the proper feeding speed for all the various drill sizes, and which incorporates an automatic release feature to protect the drill bit when stalling becomes imminent. A hand feed is available when needed. The chuck is designed to provide easy and quick changing of drill bits. The drill is readily adjusted to the proper height for holes in all sizes of rail. It is said that, with the new unit, $1\frac{1}{4}$-in. holes can be drilled through the rail web in one to two minutes.

FIRST IN LINE OF IMPACT WRENCHES

THE Black & Decker Manufacturing Co., Towson, Md., has announced the first unit of a new line of portable electric impact wrenches. This tool, rated at a $\frac{3}{8}$-in. thread diameter, is known as the $\frac{3}{8}$-in. Impact Wrench. It is equipped with a reversing switch which permits both tightening and loosening of right-hand or left-



The Black & Decker 3/8-in. impact wrench

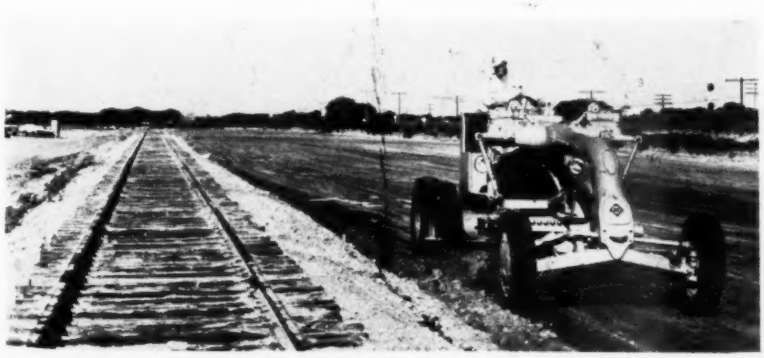
hand nuts, bolts and cap screws with equal efficiency in either direction.

When in operation the wrench first spins a free-running nut or bolt to a seating position with a direct-drive action and then tightens the fastening with a rotary hammering action. In removing a fastening these actions are applied in a reverse order, the hammering action loosening the nut or bolt and the direct drive spinning it free. The wrench is made of aluminum castings and has a Black & Decker universal motor. It may be obtained with six hexagonal sockets ranging in size from 9/16 in. to 15/16 in.

A-C MOTOR GRADER

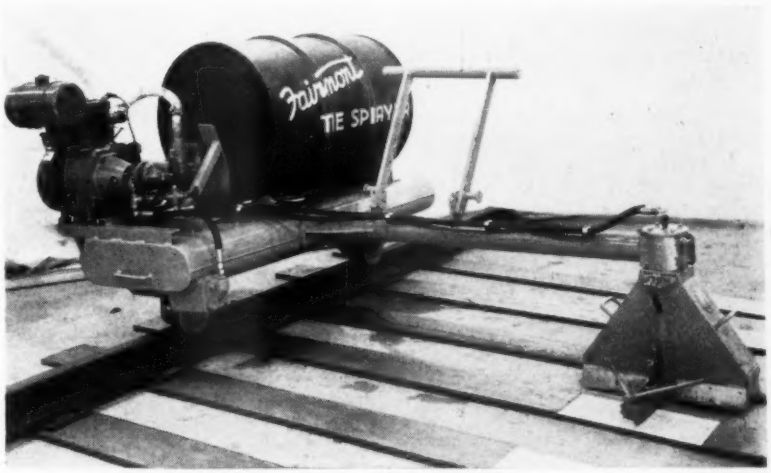
THE Allis-Chalmers Manufacturing Company, Tractor Division, Milwaukee, Wis., is introducing a rugged motor grader, known as the AD-4, designed for heavy-duty earth-moving work. The important features of the grader include a 104-hp., General Motors two-cycle Diesel engine; a tubular frame design which is said to absorb more easily the twisting stresses and shocks constantly imposed on graders, and which permits the controls to be enclosed; hydraulically-controlled front-mounted lift cases for accurate blade control; a 30-in. throat clearance which enables the AD-4 to handle bigger windrows without interference; an involute design of the moldboard which causes the material to be rolled by the moldboard and not pushed, thereby, it is said, expediting the handling of bigger windrows; and designs of the operator's platform that are said to reduce fatigue and improve operator's performance.

The AD-4 motor grader has six speeds forward, ranging from 2.4 m.p.h. to 16.6 m.p.h., and three reverse speeds ranging from 2.8 m.p.h. to 6.2 m.p.h.



The Allis-Chalmers AD-4 motor grader working on a railroad job

For additional information on any of the products described on these pages, use postcards, page 219



The Fairmont W71 Series A tie sprayer

TIE SPRAYER BY FAIRMONT

A NEW Tie Sprayer, known as W71 Series A, for applying a protective coating to newly-adzed tie surfaces, has been developed by Fairmont Railway Motors, Inc., Fairmont, Minn. It consists of an engine-driven pump and tank, mounted, along with an oil drum, on two rollers that ride the rail, and a cantilever arm terminating in a hooded spray nozzle through which the preservative is sprayed on the adzed tie surface. The spray is turned on and off automatically as the unit is pushed along the track by one man.

The preservative is heated by the engine exhaust and the temperature is controlled by a manually-operated by-pass exhaust line. The preservative is kept hot at the spray nozzle, it is said, regardless of the quantity used or occasional stops. This is accomplished by a return line from the nozzle to the pump intake. Since the pump has a greater capacity than the nozzle, the material circulates constantly from the pump, through the exhaust heater, to the nozzle and return.

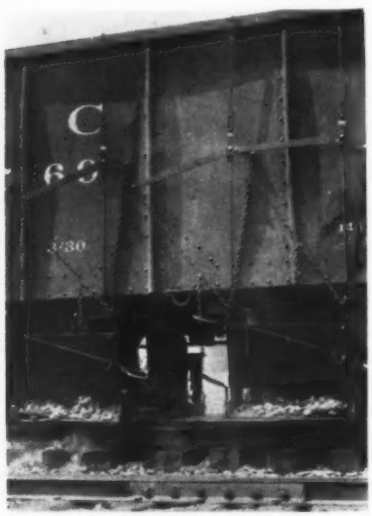
The transfer of the liquid from the drum to the tank takes place as the unit is operating. As the level in the tank lowers, air is admitted to the drum and the liquid flows from the drum to tank until the opening is closed again by the raising of the level in the tank.

The automatic trip mechanism for the spray valve is actuated by the tie surfaces. As the hood starts over the tie the valve is opened, and as it leaves the tie the valve closes. The operating speed is as fast as the operator pushes the unit along the track. The machine is equipped with a permanently attached chain sling by means of which a rail crane can lift

the machine to or from the track. Each unit is equipped with drum tongs to facilitate handling of the drum.

AUTOMATIC BALLAST SPREADER

THE Scientific Production Corporation, New York, is introducing an improved device for spreading ballast from any hopper car of the self-cleaning type. The device consists of an auxiliary hopper, made of aluminum alloy, which is suspended, by rods hooked over the top of each side of the car, in a position directly beneath the hopper of the car. It is equipped with a selector mechanism by means of which the operator, stationed at the side of the device, can control the flow of ballast from the hopper car to the track. Six adjustable selections are possible—two inside and two outside the rails, and two outside the ties.



Showing how the automatic ballast spreader is installed on a hopper car

The device can be used for controlled ballast spreading over all or any part of the standard roadbed cross section. According to the manufacturer it has been used extensively during the past two years for spreading ballast for power tamping machines and for backfilling behind these machines. The device is said to be ideal for spreading ballast in track-pan areas, switches, bridges, grade crossings and in the vicinity of signal devices; and for spot ballasting. It is reported that the device can be installed on a hopper car in five minutes.

The Hough Model HM Payloader

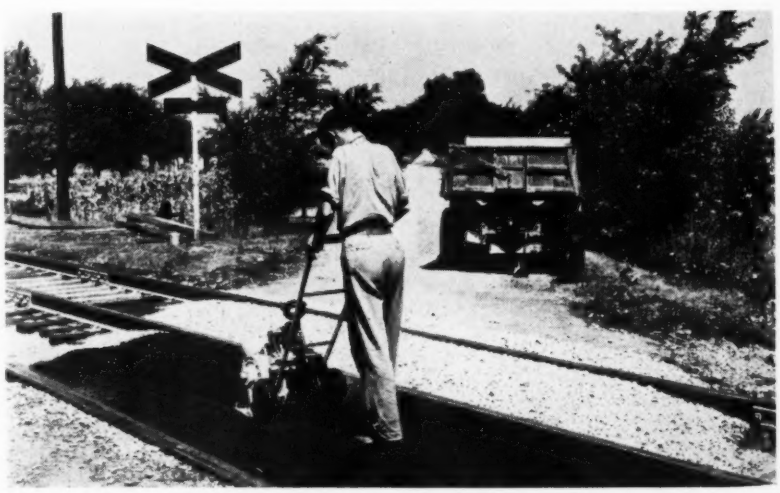
TRACTOR-SHOVEL

THE Frank G. Hough Company, Libertyville, Ill., has announced a new tractor-shovel, known as the Model HM Payloader, which features a four-wheel drive and a power steering mechanism. Mounted on pneumatic tires and driven by a 7-hp. engine, the unit can travel at a top speed of 16 m.p.h. Because it has a short wheel base, a reversing transmission with four speeds in either direction and power steering on the rear wheels, the machine is said to be highly maneuverable.

Raising and lowering of the bucket, and bucket dumping and closing, are controlled by hydraulic rams with finger-tip controls. The bucket boom is so designed that an automatic digging action is given to the bucket independent of the forward motion of the tractor. Also, an automatic tip-back of the bucket is provided as the boom is raised so that heaped loads can be retained without spilling. The Model HM Payloader has a bucket capacity of 1½ cu. yd. and a static loading capacity of 6,000 lb. Various attachments for the unit, including a bulldozer blade, snowplow blade and crane hook, are available if desired.

WAYER IMPACTOR

WAYER Impactor, Inc., Columbus, Ohio, is introducing into the railroad field a unit for tamping and consolidating bituminous paving and patching materials, which is described by its manufacturer as "a



Finishing the bituminous surface of a highway crossing with the Wayer Impactor

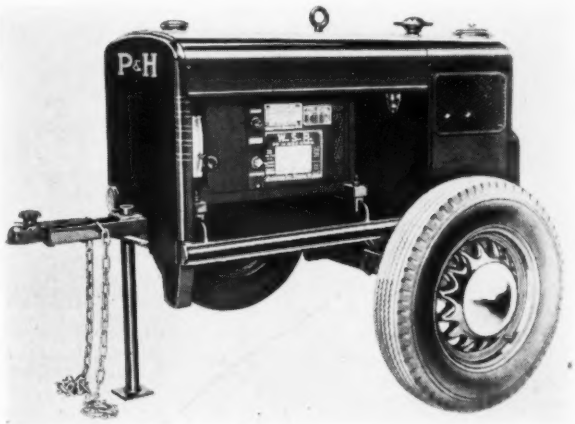
10-ton roller that weighs 230 lb." In appearance and operation the machine resembles a power lawn mower. It is equipped with an impactor, powered by a Wisconsin AB engine, that pounds a strip 25 in. wide with 1,750 to 2,000 blows per minute. It is said that, with this machine, bituminous materials can be tamped to a density equivalent to that obtained with a pass of a 10-ton roller.

The impactor and finishing shoe are heated by the engine exhaust, thus permitting, it is said, successful use of the machine at temperatures below freezing. Because the unit is small and highly maneuverable it can finish surfaces flush to railroad tracks, manholes or curbs, and can be used near rail joints without damage to track circuit bonding wires. It can be used also for compacting earth and gravel surfaces.

DUAL-PURPOSE WELDER

THE Harnischfeger Corporation, Milwaukee, Wis., is introducing a d-c welder known as the P. & H. Model WN-200, which is available with a power take-off, thus permitting use of the unit for operating 110-volt power tools and lights as well as for welding. The welder is a self-contained unit incorporating a welding generator driven by a four-cylinder, air-cooled gasoline engine through a v-belt drive. The generator and motor are mounted on an all-welded steel frame of box-type construction entirely enclosed in a steel canopy. The welder is available in a choice of stationary or portable models. It has a welding range of 30 to 360 amp.

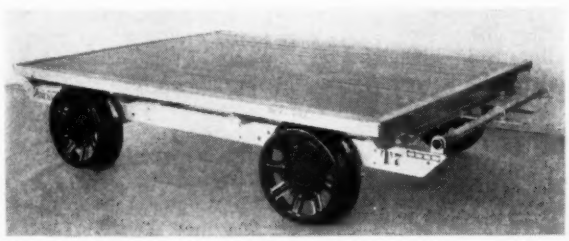
For additional information on any of the products described on these pages, use postcards, page 219.



The P. & H. Model WN-200 welder

ALUMINUM PUSH CAR

FAIRMONT Railway Motors, Inc., Fairmont, Minn. is offering an aluminum push car, designated as the T7 Series A, which has a load capacity of 6,000 lb., and which weighs only 520 lb. It can be used in any type of push-car service, but is designed especially for use where the car must be set on and off the track frequently.



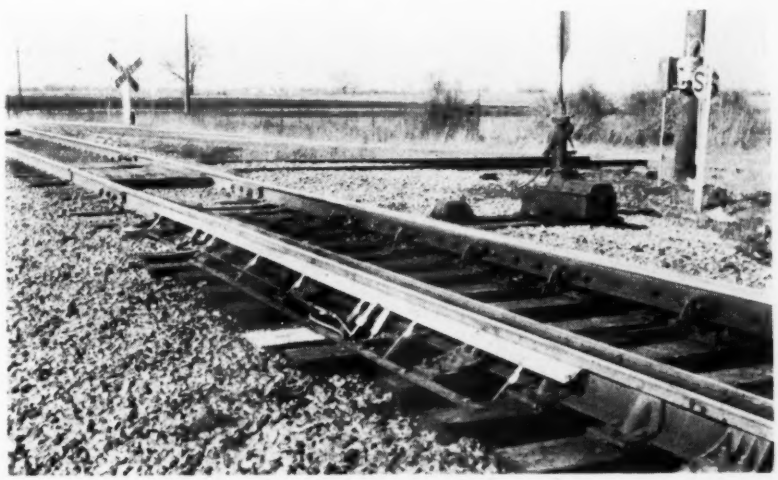
The Fairmont T7 Series A aluminum push car

All frame members except lift pipes and draw bar are of heat-treated aluminum alloy. The axle bearing casings, and the deck side-and-end angles are also of aluminum. The car has 16-in. by ¼-in. by 4½-in. demountable wheels, one differential axle, a 67¼-in. by 84-in. yellow pine deck, and pressure grease lubrication with gun included.

Accessory equipment that is available for the push car includes differential axles at both ends, four-wheel brakes, draw-bar couplers, deck dump sills, full-length rail skids, detachable seat and steps, and 20-in. wheels. Also, either the 16-in. or 20-in. wheels can be furnished with a plate thickness of 5/16 in.

IMPROVED IGNITER FOR SWITCH HEATERS

THE Rails Company, New Haven, Conn., is introducing an improved unit for electrically igniting and keeping lit the Rail-Tel propane gas switch heaters manufactured by this company. The igniter is similar in design to its predecessor, a remote-controlled unit, in that it consists essentially of a set of spark coils that transmit high-frequency current to spark plugs attached to the



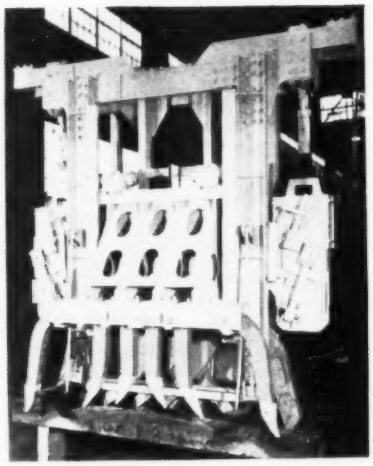
Installations of gas switch heaters equipped with the improved igniter

heater. The new igniter, however, is operated by four 6-volt dry-cell batteries, and is therefore, entirely independent of track circuits or adjacent power lines. Furthermore, the unit is activated by the pressure in the gas line rather than by a switch. When the gas is turned into the line, the igniter sparks intermittently at 30-sec. intervals, and continues in this manner as long as gas is supplied to the switch heater. The entire unit is located adjacent to the switch.

The gas may be turned into the line automatically by a solenoid valve opened by an electronic circuit controlled by the tower operator or dispatcher, or by manually opening a valve. If desired, a small thermal unit can be furnished to indicate to the tower operator or dispatcher whether the igniter is operating properly. This unit is set for a pre-determined temperature and flashes a signal through a relay to the operating room when the set temperature is obtained, thus indicating that heat is being delivered to the switch.

PULLMAN-STANDARD CRIBBING MACHINE

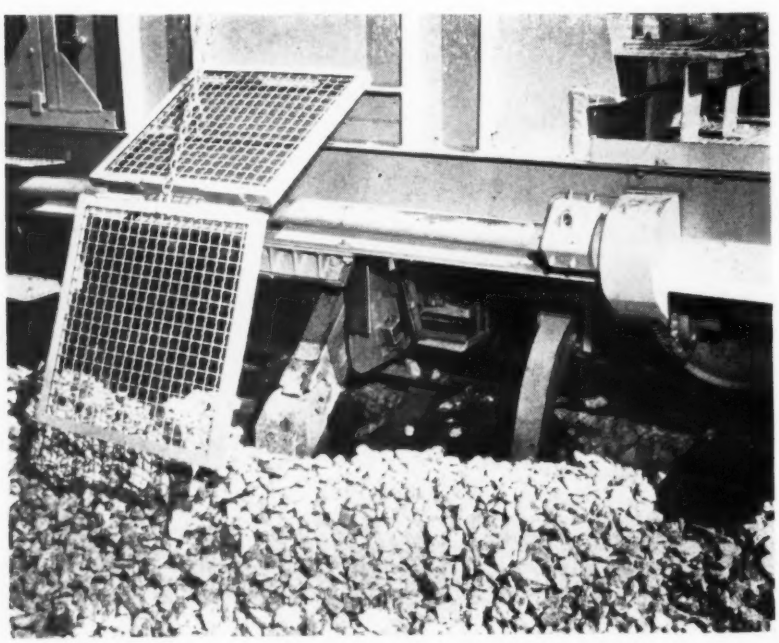
THE Pullman-Standard Car Manufacturing Company, Power Ballaster Division, Chicago, is introducing a newly-designed power-operated cribbing machine which incorporates a mechanical "pick and shovel" arrangement for removing fouled ballast from the cribs. In appearance and operation the unit resembles the Power Ballaster except that the crosshead member is fitted with two sets of digging tools rather than tamping shoes. These digging tools are lifted and then dropped in a pile-driving action.



Crosshead of the Pullman-Standard cribbing machine, showing the picks in front and, behind them, the digging bars

The forward set of digging tools consists of picks designed to loosen the ballast in the crib ahead of the one in which the main digger bars are working. These picks serve a dual purpose in that they also absorb the energy of the falling head when ballast has been removed in the crib behind. The main digger bars are so mounted on the crosshead that, as they penetrate the loosened ballast they also move traversely, breaking the ballast out toward the tie ends. After the digger teeth have reached the tie base, a cam-controlled action takes place which drives the main digger bars in a predetermined path along the tie base at an elevation varying from the level of the tie base at the center of the track to a level 3½ in. below the tie base at the tie ends.

The unit, driven by a 100-hp. gasoline engine, is operated by one man. It is said to clean out about 80 to 90 per cent of the ballast in each crib, the remaining loose material being removed by four men working behind the machine. According to the manufacturer the cribber has cleaned 8,014 cribs at an average rate of one crib every 45 seconds, working under regular service conditions and in heavy ballast. Like the Power Ballaster, the cribbing machine is equipped with an air lift by means of which the unit can be removed from the track.



In this close-up view of the cribbing machine in operation the picks are at the right and the digging bars at the left

READE TRACK ALIGNER

THE Reade Aligner, a track lining tool introduced by the Reade Manufacturing Company, Inc., Jersey City, N.J. and first described in these pages in the October, 1948, issue, has since been improved in a number of respects. Final tests of the improved tool have been completed and the company is now ready to place it in full production.

Essentially this device embodies a rack-and-pawl mechanism, contained within a steel housing to the bottom of which is fastened a curved anchor plate to engage the track ballast and provide a support for the tool when in use. It is operated by means of a standard lining bar inserted in a socket embodied in the operating lever. The toe of the rack is so designed that it may be applied to the base of the rail, or at joints, frogs, guard rails and switches. The design of the aligner is said to be such as to insure horizontal movement of the track without humping or raising it. Two of the aligners, each operated by one man, are said to be sufficient to line track or switches under most conditions, although in cases of exceptionally heavy switches three of them may be desirable.

Among the improvements that have been made since the original unit was described is a reduction in the size of the ratchet teeth to give

Lining track with two of the Reade aligners

a more uniform pull and to increase the power. Furthermore, the improved model is considerably lighter in weight than the original, and the working parts are fully enclosed to keep out dirt. A track man using the aligner is always in an erect position, and a foot trip makes it unnecessary for the operator to bend over to release the track aligner when the track has been shifted to the desired location.

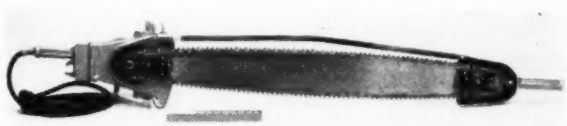
HIGH-CYCLE ELECTRIC CHAIN SAWS

THE Homelite Corporation, Port Chester, N.Y., is introducing three new high-cycle electric chain saws to supplement its 20-in., 27-lb. one-man model. One of these is another one-man saw, the Model ECS-14, which weighs only 17 lb. It has a 14-in. cutter bar and, it is said, will handle the majority of railway timber-cutting jobs. Two of these saws can be operated by a single Homelite 2,500-watt high-cycle generator.

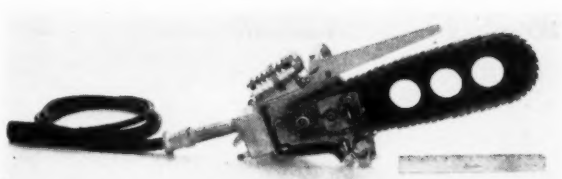
The second new model, the ECS-24, is a lightweight, two-man saw weighing 33 lb. The helper end of this saw can be removed for one-man operation if desired. Powered by a 2,500-watt high-cycle generator, the saw has a cutting capacity of 24 in. The third new saw, the Model ECS-36, is a large two-man unit for heavy-duty cutting. It has a cutting capacity of 36 in., weighs 43 lb. and is powered by a 5,000-watt high-cycle generator. All Homelite chain saws are equipped with chrome-plated chains for long service life.

THOR IMPACT WRENCH

A NEW Thor ⅜-in. universal electric impact wrench has been announced by the Independent Pneumatic Tool Company, Aurora, Ill. The outstanding features of the tool, according to the manufacturer, include positive drive, high torque, negligible torque reaction, smooth operation, simplicity in design, low maintenance and long life.



The Homelite Model ECS-36 electric chain saw



The Model ECS-14 high-cycle electric chain saw

For additional information on any of the products described on these pages, use postcards, page 219.

The wrench has a highly-polished die-casting case; a free speed, forward or reverse, of 2,150 r.p.m.; strikes 2,000 blows per minute; operates on either alternating or

The Thor ⅜-in. universal electric impact wrench

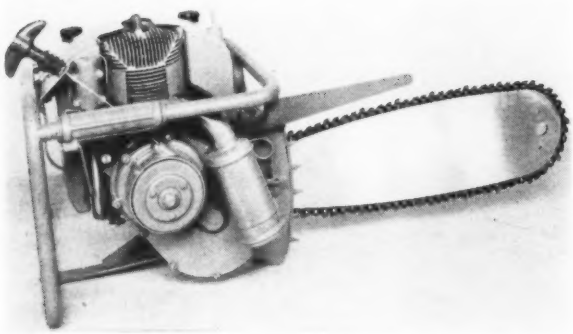
direct current; weighs 6 lb. 14 oz.; and employs a ½-in. square spindle drive with a 1 7/16 spindle offset.

UNIT RAILROAD CRANE

THE Unit Crane & Shovel Corp., Milwaukee, Wis., is introducing a new crawler-mounted crane, desig-

The new Unit Crane & Shovel Railroad crane

nated as the Unit 817R, which has been designed especially for railroad work. The outstanding features of the machine include swing limit stops, low overall height, tapered counterweight, narrow-gage crawlers, and short tail swing.



One of the Reed-Prentice 1949 model "Timberhog" chain saws

"2-IN-1" CHAIN SAWS

THE Reed-Prentice Corporation, Worcester, Mass., has announced the 1949 models of its "Timberhog" chain saws, available in 20-in., 24-in. and 30-in. cutting capacities. A feature of these saws is that they can be operated by one man or, with the addition of a helper's end, by two men, if desired. Each saw is equipped with an all-purpose chain and a lightweight 4-hp. gasoline engine with a diaphragm carburetor which permits cutting at any angle.

HYSTER TOWING WINCH

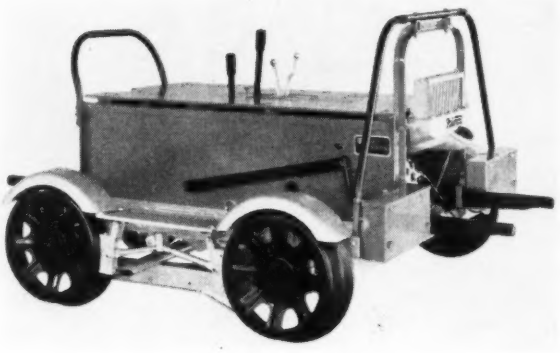
THE Hyster Company, Portland, Ore., has announced a new direct-geared, reversible towing winch, known as the D2N, for application to any Caterpillar D2 tractor. While in outward appearance the winch is nearly identical to its predecessor, the D2, it has been strengthened to meet the increased power of the Caterpillar D2 tractor. Its line pull has been increased to 13,400 lb. and its handling gear design has been improved. The gearing is oil-bath lubricated. The winch can also be mounted on all Caterpillar R2 tractors. A power take-off is available.

A Hyster D2N towing winch mounted on a "Caterpillar" D2 tractor

IMPROVED ENGINE FOR A3 GANG CAR

FAIRMONT Railway Motors, Inc., Fairmont, Minn., has announced improved performance in the operation of the engine in its A3 Series D gang motor cars, due to a new carburetor and a high-compression cylinder head. The new carburetor bolts directly onto the engine manifold for more efficient operation, and has better throttling and idling characteristics. The higher compression with the new cylinder head is said to impart a snappier performance to the engine.

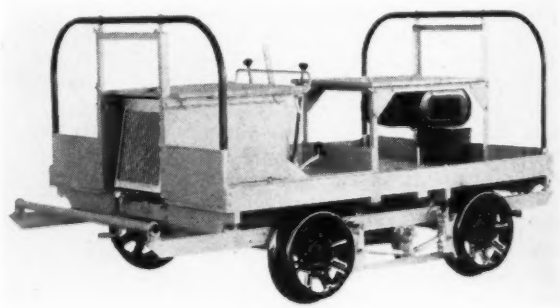
The combination of the two improvements is reported to result in an increase in power output of the engine.



The Fairmont M19 Series F motor car with five-point-cushioned engine mounting

M19 MOTOR CAR EASIER TO RIDE

FAIRMONT Railway Motors, Inc., has announced that the riding qualities of its spring-mounted M19 Series F inspection motor car have been considerably improved by the addition of a double-action cushion at each of the five points where the engine supports are fastened to the frame of the car.



The A3 gang motor car with improved engine

ELECTRIC-DRIVEN CONCRETE BREAKER

THE Homelite Corporation, Port Chester, N. Y., has developed a new type of paving breaker which is operated by a high-cycle electric motor driven by the current supplied by a 129-lb., dual-voltage, gasoline-engine-driven generator. The generator can be used for operating standard 110-volt tools and floodlights as well as the high-cycle concrete breaker or other high-cycle tools.

According to the manufacturer the important features of the new break-

A Homelite high-cycle electric concrete breaker in operation

er include a mechanism that is unaffected by dust or abrasive particles; a motor that has no brushes or commutator to wear out; no electrical connection between rotor and stator; sealed ball-bearing support for the rotor shaft; a floating cylinder that prevents transmission of shock to the driving mechanism; a positive plunger-pump lubricator with an automatic switch that stops the breaker when its oil reservoir is empty; and a smooth, flat-sided back that makes the breaker easier to move and operate. The unit weighs 84 lb.

"SUPERSOCKETS"

WITH the addition of a number of new units to its "Supersocket" line, J.H. Williams & Co., Buffalo, N.Y., has increased to more than 150 the number of sockets available for power and impact wrenches, thus providing a wide and versatile range of styles and sizes. The sockets are adaptable to all socket-locking methods used on the various types of power and impact wrenches. Their accurate fit and precision machining are said to assure long life and safe, dependable service.

They are made of specially heat-treated alloy steel to withstand the shock and pounding involved in impact nut setting or power nut running. Impact "Supersockets" are available in seven different square-drive sizes with hexagonal openings ranging from 3/16 in. to 3½ in. in size, and in eight-point openings ranging in size from 5/16 in. to 1¼ in.

A Williams "Supersocket"

CATERPILLAR SCRAPER

THE Caterpillar Tractor Company, Peoria, Ill., is introducing a hydraulically-controlled scraper, known as the Caterpillar No. 40, which features forced ejection and a flat bottom. The unit, matched to the power of the D4 track-type tractor, has a struck capacity of 3.6 cu. yd. and a heaped capacity of 4.5 cu. yd. It is 21 ft. ½ in. long overall, 7 ft. 5½ in. wide and is said to be easy to maneuver and operate.

The unit is furnished with hydraulic jacks and hoses leading to the forward end of the scraper pole, and requires a pump having a minimum capacity of 35 g.p.m. at 1,400 r.p.m. and capable of supplying a continuous pressure of 1,000 p.s.i. If desired, the manufacturer is offering for use with the scraper a front-mounted hydraulic power-unit arrangement consisting of a 37-g.p.m. pump, double valve, hydraulic lines, mounting and drive parts, and a tank with additional oil capacity.

The Caterpillar No. 40 hydraulic-controlled scraper

ORTON BUILDS LARGE LOCOMOTIVE CRANE

THE Orton Crane & Shovel Co., Chicago, recently completed for the Chicago, Burlington & Quincy a locomotive crane having a capacity of 60 tons, which incorporates a number of noteworthy features. To be known as the Orton Model 60 crane, the unit is claimed to be as large as any crane ever built. It is intended as a combination bridge derrick and pile driver, and will be used by the Burlington in all classes of bridge work over the entire system.

The crane is steam operated and has an over-size boiler for operating a pile hammer. It is mounted on twelve wheels to reduce the axle loading, and has anti-friction bearings throughout, air-control of all movements, and air brakes.

The Orton Model 60 Locomotive Crane

IMPROVED SCARIFIER

FAIRMONT Railway Motors, Inc., Fairmont, Minn., has made a number of changes in its M23 Series E ballast scarifier, discer and blade unit, which are designed to improve performance and reduce maintenance. These improvements include: New, precision-constructed air valves that are said to give better action and holding power and are more easily controlled; an improved lubricator for the air valves which has a sight feed for accurate quantity control; a new location nearer the operator of the manual com-

For additional information on any of the products described on these pages, use postcards, page 219.

The Fairmont M23 Series E ballast scarifier

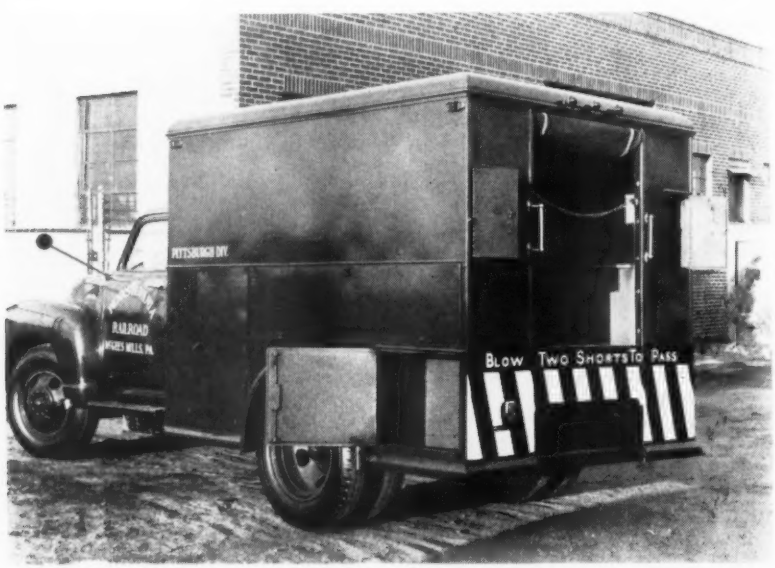
pressor unloader, used when starting the engine; a new lubricated hoist-rod packing gland to lengthen the life of the rod packing; relocation of the grease fitting for the clutch throw-out bearing, which simplifies lubrication of this part; and synthetic rubber air lines from reservoir to filter, air manifold to valves, and valves to hoist lines, that are said to have a long life and to be easy to couple and uncouple.

TRUCK BODIES FOR RAILROAD GANGS

CUSTOM-BUILT truck bodies, designed expressly for railroad use, such as hauling track, bridge, paint and signal gangs to and from the point of work, are now being offered by the Atlas Body Company, Philadelphia, Pa. The bodies are built to meet the desires of the purchaser and offer a number of special features including tool compartments on each side of the body, outside ladder racks and tool compartments also on the inside of the body.

Suitable seating is provided for personnel and the riding compartment is warmed by a special body heater. These bodies are of steel construction throughout, although ship-lapped oak flooring is available if desired. All parts are said to be rust-proofed. The size of the compartments can be varied to suit the purchaser.

The Bucyrus-Erie Model H-3 Hydrocrane



One of the Atlas Custom-Built truck bodies made for railway use

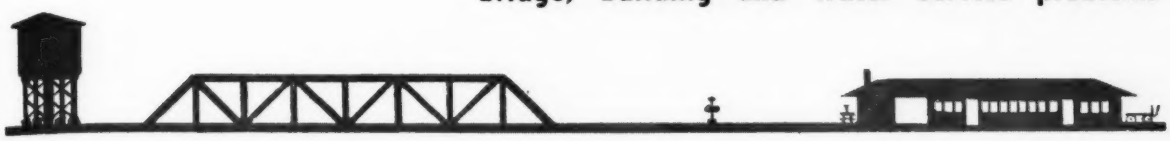
TRUCK-MOUNTED CRANE-EXCAVATOR

THE Hydrocrane Division, Bucyrus-Erie Company, Milwaukee, Wis., has added a new truck-mounted unit, called the Model H-3 Hydrocrane, to its line of mobile cranes. Equipped with a telescoping boom (18 ft. to 26 ft.), the crane can be used for various lifting operations, or with a clamshell or orange-peel bucket for excavating purposes.

All functions of the crane, including raising, lowering, swinging and telescoping the boom, are hydraulically controlled, as are the operations of the crane attachments and the outriggers. The hydraulic pumps are driven by a power take-off from the transmission of the truck's engine. The unit has a capacity of three tons.

WHAT'S THE ANSWER?

An open forum for maintenance men on track, bridge, building and water service problems



Lubricating Switch Slide Plates

Should the slide plates of switches and spring-rail frogs be oiled? What are the advantages and disadvantages? How can any disadvantages be overcome? Explain.

Generally Uses Oil

By T. M. Pittman
Division Engineer, Illinois Central, Memphis, Tenn.

It is a general practice to oil slide plates of switches and spring-rail frogs. This makes the switch throw easier and the frog spring rail move freely, and prolongs to some extent the life of the plates. The oiling is usually done about once every month and the results obtained are well worth the expense.

Generally speaking there are no objections to the oiling of the plates. However, if the oil used in winter is too heavy, it might make the switches hard to throw. There are certain locations where oiling might be objectionable, particularly where enginemen customarily use their sanders or in locations at which sand is frequently blown in from adjacent land. Oil, if applied at such places, will hold the sand and cause greater wear; whereas, if the plates were not oiled, the sand would blow or fall off.

The most common cause of a switch throwing hard is its being out of adjustment. Oil will not overcome that condition.

Oiling Adds Life to Switch

By F. L. Wilson
Roadmaster, Missouri-Kansas-Texas, DeLeon, Tex.

There are many advantages in oiling the slide plates of switches and spring rails of frogs, and the need for doing so grows greater in proportion to the increases in the cost of material and labor. In the first place, a well oiled switch works freely, can be handled with little time and effort, and with much less strain and wear on all working parts.

A poorly oiled switch causes a strain on the spikes or fastenings used to hold the stand to the head blocks. The back and forth movement of the switch soon works the stand loose, causing poorly fitting switch points. This not only requires that adjustments be made more often, but is hard on all working parts of the switch, reducing their service life. The elimination of these adverse factors is one of the greatest advantages of oiling spring frogs and switch plates.

Too much cannot be said and done about the oiling of switches. It is an inexpensive job. The oil can be of the cheapest grade, and can be applied when crews are delayed at switches, from an oil can carried on the motor car. I have also noticed that the oiling of switches creates a kind of pride in a foreman that fosters a more active interest in his switches. He looks them over better, and just does a better job of maintenance when you get him interested in keeping his switches well oiled.

There are disadvantages in oiling slide plates and frog spring rails but they can be overcome. Regularly oiled switches may collect dirt and sand, especially at points where sand is used during switching movements. However, a good scraping off once a month will keep such switches cleaned. This can be done with very little time and labor. Although excessive oil creates a rather messy condition around switches, the messiness can be minimized with a little care in oiling.

I estimate that a poorly oiled switch or spring frog will shorten the life of the working parts of the

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 105 W. Adams St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In The May Issue

1. To what extent should standby track material be provided at interlocking plants to make emergency repairs to switches, frogs, etc.? At passing sidings in C.T.C. territories? Explain.

2. What is the best way to supply electric power to camp cars? What voltage should be used? What are the essential features of the wiring involved? What outlets should be provided? What precautions should be taken?

3. What constitutes a satisfactory farm crossing from the sandpoint of the user and that of the railroad with respect to economical track and and crossing maintenance?

4. Under what circumstances does electrolytic corrosion of steel in concrete occur? What are its effects? How can it be prevented or diminished?

5. Should curves be lined before or after being given a general surfacing? Why? What factors are involved? Explain.

6. To what extent should water facilities for steam locomotives be abandoned with increased Dieselization? What disposition should be made of such abandoned facilities? Explain.

7. To what extent can mill ends of lumber be used in the repair and maintenance of railway buildings? What are the advantages of using such materials? Explain.

switch 20 per cent, the life of the head-block ties 25 per cent, and the life of the switch ties under the frog 30 per cent. Furthermore, the labor cost of maintaining the turnout will be 20 per cent more than that required to service a well-oiled switch.

Lubricate, But Don't Oil

By John C. Rouse
Extra Gang Foreman, Southern Pacific, Niles, Cal.

Clean and well-lubricated slide plates are essential to the free movement of switch points. Whether it is a spring switch, an electrically-operated switch, or one of the hand-throw type, the points must move freely and without undue resistance.

However, oil on a slide plate is too efficient as a collector of engine sand and other debris, the accumulation of which makes it necessary to clean and oil the plates quite frequently to keep the switch points moving in the right manner.

I have secured very good results by using flaked graphite mixed with just enough coal oil to form a thin paste, which I apply to the slide plates with a paint brush. Within a few minutes the plates are dry, yet they have the necessary amount of lubrication to insure the free and easy movement of the points. The plates, being dry, can be swept off very easily with an ordinary house broom.

The vibration as well as the suction created by passing trains will keep the sand and other debris off of the plates, thereby reducing the amount of work necessary to keep them clean and well lubricated as compared to the method of oiling them. The same can be said for the plates under the wing rails of spring frogs and frogs having movable points, as they are subject to about the same conditions as slide plates under switch points.

Cleaning Enginehouse Floors

In what effective ways can oil and grease be removed from enginehouse floors to reduce the hazard of slipping? Can any of these ways be used where oil and grease get on low-level station platforms? Explain.

Special Cleaners Effective

By F. J. McNally
Division Manager, Oakite Products, Inc., Chicago

An easy way to reduce slipping accidents on enginehouse floors is to use a specialized floor-cleaning material regularly to remove oil and grease deposits. For economy, it is best to use a material that may be diluted with water. The material used should emulsify oil and grease quickly. It should penetrate caked-on deposits, if any, thoroughly. It should rinse freely so that no after-rinsing film (dangerous for walking) will remain on the floor surface. Also, it should be safe to use and should not contain solvent or volatile ingredients. The material should provide effective, economical cleaning at low solution concentrations when applied by mop, brush or perhaps rags.

To keep floors clean for longer periods they should be sprinkled after cleaning with a recommended quantity of a very dry, lightweight, nearly dustless, granular material having the ability to soak up oil, grease, moisture and water. The absorbent granules of such a material provides a carpet of safety by soaking up objectionable oil and grease drippings. At intervals, the granules may be merely swept together and discarded. In addition to high absorbency, such a material should be fire-resistant, even when soaked with oil.

In a Diesel-locomotive shop at which engines are removed for overhaul, floors and the entire room should be thoroughly cleaned. This situation requires a different cleaning procedure for maximum speed and economy. A specialized steam-detergent cleaner can be applied through a solution-lifting steam gun to remove easily and quickly all grease, oil drippings, and accumulations of caked-on dirt. Walls and ceilings may also be cleaned at this time. A hot-water rinse spray completes the cleaning.

Low-level station platforms may be cleaned with a material similar to the one described in paragraph one, or if deposits are heavy, a specialized steam-detergent material may be used, if steam is available, again applied through the solution-lifting steam gun. The easy-to-use steam gun will enable the operator to reach oil and grease deposits not normally accessible by mops, brushes, etc. The gun may also be used for rinsing purposes. After the cleaning operation, the low-level surfaces may be sprinkled with an absorbent, granular material to soak up oil and grease drippings and to prolong intervals between cleaning. The granules, when heavy with oil or grease, may be swept away with a broom.

Burns Grease Off

By G. W. Short
Master Mechanic, Baltimore & Ohio, Chicago Terminal, Chicago

For the purpose of removing oil from shop floors, we use a commercial oil absorbent which we find is very effective, and, no doubt, it could be used to advantage on low-level station platforms. The problem of removing accumulated grease from shop and enginehouse floors has been with us for a long time and various methods have been tried with indifferent success.

At our Lincoln Street enginehouse, we have 33 stalls, 25 of which are used for steam engines. A few years ago we developed a burner to remove the accumulated grease from the steam section of the enginehouse and it does a very good job. This burner is a piece of 1¼-in. pipe capped on each end, with a series of 3/16-in. holes drilled across the bottom. Attached to the center of the burner is a 15-ft. piece of 1-in. pipe which is used as a handle by the operator, and to this pipe is attached the oil and air hoses. At each end of the burner is welded a ¾-in. runner which serves the purpose of elevating the burner above the floor and at the same time enables the operator to push the burner over the floor in the manner in which a vacuum cleaner is used. These runners are bent up on each end to prevent them from digging into the floor. We use a standard vacuum-type oil tank for the oil supply and use a 50-50 mixture of fuel oil and carbon oil. A shield of ⅛-in. sheet steel covers the burner to direct the flame toward the floor.

We have removed as much as ½ in. of accumulated grease from concrete floors with the only residue from the burned grease being a fine dust which was swept up without trouble. Of course, it is necessary when using this machine to keep it moving and not let it rest on one particular spot on the floor,

otherwise, it is possible to cause damage to the concrete. However, we have been using it for several years now without any damage of this nature. As a safety measure, we always have a fire extinguisher available when we are using this machine.

Storing Switch Heaters After Use

When switch heaters of various types are removed in the spring, how should they be cared for to insure their effective use another year? Does the type of heater make any difference? Explain.

Set Up Program for Care

By R. H. Mitchell
Division Engineer, Boston & Maine, Boston, Mass.

To insure effective use of various types of switch heaters for another year, there should be a program set up for their care on removal in the spring. Pot-type heaters should be drained and their wicks removed and inspected. All defective heaters should be shipped to a central tin shop for repairs or replacement. Those in good condition should be stored under cover until needed for use in the fall.

Both commercial and propane-gas type heaters should be removed from track, including their connections as far as the supply main, and each unit tagged as to its location. Having removed the heaters, plugs should be installed in the mains and all lines should be checked for leakage so that any repairs needed can be made during the summer months. Heaters should be inspected in a shop to determine defective parts. Necessary repairs should be made before the heaters are finally stored in a suitable location.

Generally, gravity-type, oil switch heaters are left in place. The entire installation is inspected for leakage, wornout parts are replaced, and igniter caps installed.

Regardless of the type of heater, an inspection of each unit should be made in the spring so that a program for repairs may be made to assure that all heaters will be in condition for service when required in the fall.

Gas Heaters Need Attention

By A. R. Jones
Division Engineer, New York Central, Albany, N. Y.

On this division, three types of switch heaters are used, namely: electric, open-flame oil pot and gas. After installation the electric heaters remain in place through the summer months. Inspection and any repairs needed are made just prior to winter use.

Our oil pot heaters are removed in the spring, the oil drained off, the cover slid into place over the wick chamber, and the heaters stacked in piles in under-cover storage. When needed in the fall, they are filled with oil, the wick exposed, and then are placed in position under switch points.

Gas heaters require the most attention. At the close of a winter season all heaters are removed and stored. The outlet supply pipes are plugged with caps or plugs. A metal tag, marked to identify the location from which the heater is removed, is applied to each heater. After the heaters are stored under cover on racks, each is taken apart for cleaning. The fastenings which hold the heat distributors to the center casting are removed. In many cases a bolt in a fastening is worn and has to be renewed. The ⅜-in. brass pipes are removed from the heat distributor housings and the jet holes are reamed out and the pipes polished on a buffer wheel. The brass pipe and plugs are tightened and resoldered. After all parts of a heater are cleaned, checked and repaired, the heater is reassembled and placed in a storage rack. About one month in advance of winter conditions the heaters are applied to the switch rails.

Spring Care Needed

By David D. Housenga
Section Foreman, Chicago & North Western, Fulton, Ill.

I have used kerosene-burning switch heaters at interlocking plants on my section since the winter of 1943. I take them out of all switches at the end of the winter season, drain out the kerosene and clean the inside of each. Then I install new wicks in all of them and scrape from the outside of the heaters all the salt deposited from brine falling from passing trains. I then paint them with an iron preservative to keep them from corroding. After this is done, I pile them upside down on racks built for the purpose, so that rainwater will not get into them. Cared for in this manner, the heaters are always ready for service the following fall.

Flashing Building Roofs

What changes in methods and materials have occurred in recent years in flashing building roofs? Explain. How effective are they?

Must Have Good Workmanship

By General Building Foreman

Building men generally agree that the correct application of base flashing and edging is one of the most important phases of any built-up roofing job. All agree, too, that most of the defects found in built-up roofs have their origin in some form of flashing.

Metal flashing, particularly copper, was considered for a long time as the best type of flashing material. Under the impetus of this challenge and other factors, roofing manufacturers have developed various types of relatively new flashing materials, varying from aluminum foil to copper-clad, heavy building paper, etc. Some of these have been tested in service for a length of time sufficient to prove their worth. Among them, fabric-reinforced asbestos flashing materials are considered very effective for railroad uses.

The use of good materials is important, but without good workmanship in their application the effectiveness of their quality is lost. One source of trouble can be eliminated by following a simple rule—that no roofing material which is nailed to the deck should ever be also nailed to any vertical surface along which it may be turned; and no flashing that is nailed to a vertical surface should ever be nailed to a roof deck. The observance of this rule, especially for base and cap flashing, permits roofing and

flashing to expand under varying weather conditions without breaking the felts. By the same token, it provides for movement or settlement of the roof and building under load or for other reasons.

Flashing can be nailed horizontally along its upper edge to wood frame structures, and also into the mortar joints of brick structures. It can be carried down and out onto the roofing to which it should be cemented—not nailed. To protect the nail heads and prevent water from getting behind the base flashing, apply asbestos-fibred asphalt cement in a 5-in. band, centered along the upper edge of the base flashing. Embed into the cement a 4-in. strip of 15-lb. asbestos felt, over which another application of cement is made. As a further protection a similar strip of asbestos felt can be centered along the bottom of the base flashing and cemented with hot asphalt.

Always in new construction, and whenever possible in maintenance work, flashing should be turned back into a raggle in parapet walls or across the entire width of the wall beneath the coping to prevent the infiltration of water from the top of the wall to the back of the base flashing. As a further precaution all metal or masonry surfaces against which flashings are to be applied should always be given an application of asphalt primer.

Treating Diesel Make-Up Water

To what extent are small standby water-treating facilities needed at outlying points to provide make-up water for Diesel locomotives? Why?

Base Facilities on Need

By E. L. E. Zahm

Water Engineer, Missouri-Kansas-Texas, Parsons, Kan.

All types of Diesel locomotives require water of proper quality for the engine cooling systems and this water is usually supplied at terminals. Standby stations to supply water of suitable quality at outlying points are not ordinarily required as the normal evaporation losses do not materially deplete the supply in the cooling systems between terminals.

Diesel passenger locomotives are equipped with steam generators to supply train heating, air conditioning, and hot water for passenger cars and diners. The water requirements for these generators are based on the number of cars handled and length of time on the road. A definite amount of water per car per hour is required for this service. Therefore, stations to provide water of suitable quality for this service should be spaced according to calculated requirements, depending on these factors. Also, the water capacity of the engine storage tanks should be considered in determining the spacing of the stations and attention must be given to running schedules to avoid train delays due to this service requirement. A reasonable safety factor should be used in determining the spacing of the water stations to allow for unavoidable train delays on road.

If all factors are carefully considered when installing Diesel water stations, it should not be necessary to maintain small standby facilities at outlying points. The installation of such standby facilities could further be avoided if more considerations were given the matter of engine-water storage tank capacity which, in most cases, at present, is too small to allow maximum water runs. In view of the fact that successful steam generator operation depends on the quality of the water and that the installation of a suitable Diesel water station usually entails considerable expense, it would seem economical to increase the water storage capacity on the engines.

Adds Chemical at Shop

By W. D. Gibson

Water Service Engineer, Chicago, Burlington & Quincy; Chicago

I am assuming that what is meant by make-up water for Diesel locomotives is water for the cooling system rather than boiler water for heating passenger cars.

The matter of a proper quality of water for the cooling system should be of concern. Almost all available water supplies contain mineral salts in varying amounts, which become insoluble and are precipitated at comparatively low temperatures, depositing scale on any exposed surfaces. Obviously, continued deposits will impair the efficiency of the cooling systems and eventually will lead to heavy expense in cleaning, etc.

On our line practically all cooling system waters are obtained at the principal maintenance points. Usually the water supplies at such places are comparatively low in scale-forming minerals, but at some outlying points only hard water is available.

Originally, at the points at which only hard water was available, it was the practice to use condensate when possible or, in its stead, water which had been treated for locomotive boiler purposes. Later, a proprietary compound was developed by one of the leading water-treatment concerns in conjunction with Diesel locomotive builders. This compound is now added to all water that is put in the cooling systems whenever it is necessary to drain them at a maintenance point. This compound lends a distinctive color to the cooling water and can be introduced in such concentrations that small amounts of water can be added to take care of such evaporation as might occur in normal operation. These additions can be made without reducing the effectiveness of the solution. The color feature is valuable in that anyone can tell at a glance whether the solution is of proper strength.

Our mechanical department reports that since the general use of this compound was begun, the interior surfaces of the cooling systems have been found to be entirely free from incrustation.

Plants Not Advocated

By A. B. Pierce

Engineer Water Supply, Southern, Washington, D. C.

The answer to this question would, of necessity, depend on the average hardness of the water to be used for Diesel cooling systems. The Southern is fortunate in having comparatively low-hardness water at its primary watering points where Diesels are maintained, and also at intermediate points. At practically all watering points, however, the dissolved oxygen content of the waters is in excess of the minimum concentration necessary to eliminate corrosion of the cooling system.

The treatment for this condition can be the simple addition of accepted commercial corrosion inhibitors to the Diesel water tanks directly or through the intake line at the watering point. The small amount of dissolved solids in the water generally eliminates the necessity of complete

(*Continued on page* 304)

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water softeners, which involve considerable initial expense and costly operation.

When our Diesel cooling systems are drained, flushed and refilled periodically at maintenance points, the corrosion inhibitor is added to the refill water when required. If it is necessary to drain the system, the treated water is pumped to storage tanks and reused to prevent loss of chemicals and water. In road operation of the Diesels some water is lost by evaporation, but any loss due to leakage within the engines is negligible because of recent improvements in tighter cylinder heads and better grade seals. Thus, with the present Diesels very little water is required to be added on the road for make-up water. Any unnecessary watering should be eliminated as it disturbs the concentration of the chemical treating compounds in the cooling system. For these reasons small standby water treating facilities are not advocated at outlying points.

The proper quantity of inhibitor is established at the terminal and this is believed to be adequate for normal runs of the locomotives. The small amount of water that must be added to the cooling tanks on the road to maintain adequate operating capacity does not materially affect the strength of the inhibitor already in the system. However, when the Diesels are brought into the terminals for maintenance inspection at established mileages, concentrations of inhibitor are checked and, when necessary, additions are made. This chemical test can be made by colorimetric or electrical methods, as preferred. Personnel at the terminals, trained in the operation of the testing equipment, are qualified to ascertain the correct proportions of inhibitor in the cooling system, and therefore should be the only ones involved in adding treatment to the system.

The addition of make-up water to the cooling system primarily at terminals is further advocated because it is necessary, in filling the tanks, that the water be maintained below an established gauge level set by the manufacturer on the tank. Water above this level overflows into the engine, is subject to freezing, and its loss means a loss in potency of the chemical inhibitor in the tank. Terminal personnel are aware of this rule, but at intermediate points the knowledge of attendants may be limited. The unecessary addition of cooling water, treated or untreated, on the road at outlying points increases the possibility of improper filling of the water tanks.

We do not advocate the application of chemicals at intermediate watering points, at which tests cannot be made satisfactorily, or where facilities for such tests of chemicals are not available.

No Need for Standby Plants

By B. W. DeGeer
Engineer Water Service, Great Northern, St. Paul, Minn.

So far as I know there has been very little need for standby water treating facilities for use at outlying points where water is required occasionally by Diesel locomotives. However, connections are often provided at such stations through which water treated for locomotive purposes can be furnished to Diesels for use in steam generators, if necessary.

As the facilities used to condition this water are usually fairly reliable, it seems unnecessary to provide special standby equipment to protect the small amount of water that may sometimes be required on Diesel locomotives. Cooling water is seldom required at outlying points, and in case of emergency the small amount of water that might be taken from heated supplies for steam locomotives would probably do little harm.

A survey made by an American Railway Engineering Association sub-committee during 1946 indicated that no railroads were furnishing independent feeders at intermediate stations to condition water for use on Diesels, but quite a number had feeders on locomotives for this purpose. This seems to work out very well in practice on our railroad.

Choosing Size of Stone Ballast

What is the best size of stone ballast to use under present-day conditions? What factors are involved?

Two-Inch Ballast Best

By F. R. Miller
Supervisor of Track, Michigan Central, Kalamazoo, Mich.

During past years we purchased ballast from 1½ in. to 2½ in., which at various times would run to a maximum size of 3 in. or more. Last year our ballast was 1 in. to 2 in. and seldom, if ever, exceeded the 2-in. maximum.

The ballast that exceeded the 3-in. maximum in prior years was not satisfactory because our average lift when using tamping machines, as well as when spacing and applying ties, was 2½ in. Under these circumstances it was both uneconomical and inefficient to work our track.

Last year, using the ballast of 2-in. maximum size, we were able to do our work easier and to maintain a better surface on our track, both with machine tamping and when spacing and applying ties.

Prefers Two-Inch Maximum

By W. M. S. Dunn
General Roadmaster, New York, Chicago & St. Louis, Cleveland, Ohio

It is my opinion that stone ballast should be broken into fragments which range, with fair uniformity, between the maximum dimension of 2 in. and a minimum of ¾ in.

The prime function of ballast is twofold: (1) to provide satisfactory drainage; and (2) to transpose and distribute the impact and load from the ties to the subgrade.

Of great importance to a maintenance man is the surface condition of his track. To attain the desired surface, he must have uniformly stable bearing under the ties and this cannot be attained unless there is a consistent uniformity in the grading of the ballast.

When using mechanical tools to tamp track, it is impractical and uneconomical to attempt to use ballast graded larger than 2 in. unless a 4 or 5-in. surface raise is being made.

More Study Needed

By Track Supervisor

The *best* size of stone ballast to use under present-day conditions is, in my opinion, indeterminate. I have been unable to find enough factual information on which to base a definite conclusion as to a size that would be adequate for all conditions of speed, traffic, tamping and ballast-cleaning practices, climate, roadbed, price and labor costs.

On the basis of the performance of ballast having a maximum size

(*Continued on page 306*)

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of 2½ in., I am in favor of a smaller size. In the past when it was more or less standard practice to raise track four, five or even six inches, one of the disadvantages of large ballast was insignificant. However, now, when such high raises are no longer in vogue, and small lifts are the rule, a 2½-in. ballast is not satisfactory. The effective work of our modern on-track tampers can't offset the disadvantage of having a ballast which approaches and some times exceeds, in size the height the track is raised. The light raise has proved its effectiveness in saving man-hours of tamping, producing small settlement, and requiring little back surfacing, in spite of its being done on large ballast. I believe its benefits could be increased by the use of a ballast having a maximum size of 1 in.

The adverse effect of large ballast and the beneficial effect of smaller ballast are not felt so much in raising track as in surfacing it. On high-speed railroads, even loose ties produce a rough ride. Is it economical to tighten loose ties, or even surface a joint that is ½ in. low, with 2½-in. ballast? How much damage is done to the tie bed when using such ballast under such conditions? I can't answer these questions definitely, but I have my suspicions. Would not smaller ballast, which tamps easier and does less damage to tie beds produce a surface that would last as long? I think it would.

Small-size stone ballast has been used effectively where speeds are low and tonnage high. Its benefits, I am told, are pronounced, especially in territories in which headend cinders are blown out of stacks in large quantities. One of its benefits in such cases is that the cinders are retained on the top of the ballast to a large extent, and do not filter down into voids and block drainage as they do in standard-size ballast. Would not this feature be an advantage in minmizing the fouling of ballast, even where headend cinders are not prevalent? Most of the dirt that fouls ballast comes from the top, as droppings from cars, wind blown material, etc., and anything that will minimize this fouling will certainly pay dividends.

Are we not warranted in making a thorough comparative study of types of stone ballast now in use and those that theory indicates might serve us better? Would not controlled service tests seperate the "facts from fancies," and establish some basic truths on which individual roads could base their specifications? As a basic ingredient in our track structure, ballast should certainly receive its due share of study pointed toward modernization.

Filling Timber Trestles

When filling timber trestles, is there any advantage in removing the caps when removing the stringers? Any disadvantages? Why? How should it be done?

Always Remove Caps

H. M. Tremaine
District Engineer, Northern Pacific, Spokane, Wash.

There are no apparent disadvantages in removing the caps unless one considers the extra time required in removing the deck, and this feature should not prove of moment if the work is carefully planned and sufficient men and equipment are available. Caps may be removed by hand labor, using jacks, or by cutting them out. Usually the preferable method is to pull them out with a crane, assisted by hand effort when required.

Caps should always be removed by one method or another. Failure to do so will result in initial pockets or cavities in the roadbed. These cavities will ultimately cause settlement of the roadbed and track, and instances have occurred where settlement was so sudden as to cause dangerous distortion of the track level. Eventually the caps and the sustaining posts, if of wood, will rot and the track settlement will be repeated.

If the trestle is a part of the original construction, experience has shown that it is well to keep the cutoffs of the piling or frame bents as far below the subgrade level as possible to lessen the ultimate settlement of the fill. When timber trestles are filled, attention should also be paid to removing the bracing, to the extent possible, as the fill progresses upward and its weight eliminates, to a large extent, the need for the bracing.

Not Economical to Remove

By E. J. Pratt
General Roadmaster, Union Pacific, Portland, Ore.

It has been my experience that it is not economical to pull the caps when removing the stringers. As a general rule these caps have had several years of service by the time the bridge has been filled and it would cost considerably more than the caps would be worth to dig down where you could take them from the piling without damaging them.

There is no advantage that I can see in removing such caps, as their deterioration is generally a slow process and does not weaken the track structure to a great extent if they are left in.

Remove Horizontal Timbers

By W. C. Harman
Supervisor Bridges and Buildings, Southern Pacific, San Francisco, Cal.

When a trestle is filled, as much of the timber should be removed as can be without too much expense. The reason, of course, is that a new fill should be made as compact and as nearly permanent as is possible in as short a time as possible.

Regardless of the effort expended in making a sound fill, there are bound to be voids under any caps that are left in. These voids will affect the settlement of the new fill and will result in added maintenance. Eventually, the progressive decaying of these timbers will cause additional settlement in the roadbed.

If adequate arrangements are made beforehand, it will be easy to remove the caps at the time the stringers are removed. To accomplish this the sway-brace bolts and all fastenings to the caps should be removed, except the vertical drift-bolts which will pull out easily with the caps. A sling or choker of wire rope or chain should be placed around each cap before the filling reaches it. Assuming that there is a crane of some kind on the job for removing the timbers, it will take only a little time to hook into the choker and pull out the cap. If there is no crane available, a line to the work train can be used to good advantage for pulling the caps away from the old piles.

I believe that in filling a trestle all horizontal timbers should be removed and, with a little planning, this can be done inexpensively.

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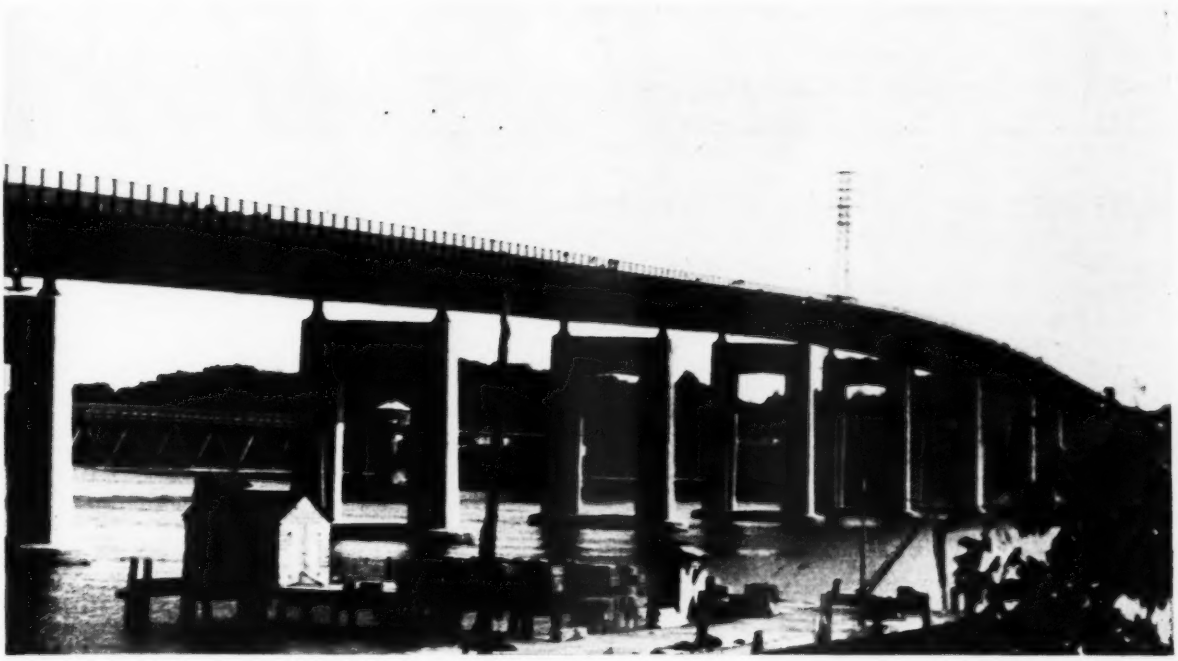

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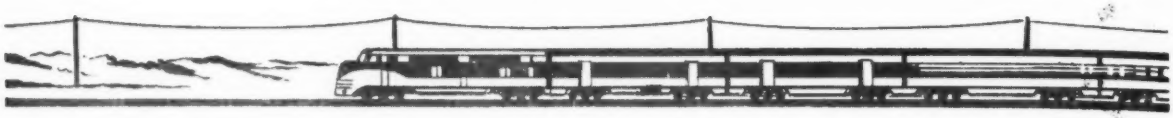
THE MONTH'S NEWS

Happenings among the railways—the associations—the suppliers



Changes in Railway Personnel

General

R. B. Ball, vice-president and general manager of the Gulf, Colorado & Santa Fe (part of the Atchison, Topeka & Santa Fe System), with headquarters at Galveston, Tex., and formerly assistant chief engineer—system, has retired.

R. B. Fetters, division engineer on the Oklahoma division of the Chicago, Rock Island & Pacific at El Reno, Okla., has been promoted to assistant superintendent at Goodland, Kan. A sketch of Mr. Fetters' career appeared in the October, 1948, issue in connection with his appointment as division engineer.

A. M. Harris, superintendent of freight transportation of the Eastern region of the Pennsylvania, with headquarters at Philadelphia, Pa., has been advanced to superintendent of the Fort Wayne division, with headquarters at Ft. Wayne, Ind., succeeding **Park M. Roeper,** who has been transferred to the Middle division at Altoona, Pa. Both Mr. Harris and Mr. Roeper are engineers by training and experience.

Moultrie B. Oliver, assistant superintendent of the Charleston & Western Carolina, with headquarters at Augusta, Ga., has been appointed assistant to the general manager of the Atlantic Coast Line, with headquarters at Wilmington, N.C. **W. H. Kendall,** staff assistant on the Atlantic Coast Line, at Wilmington, has been promoted to assistant to the general manager with the same headquarters. Mr. Oliver and Mr. Kendall are engineers by training and experience.

Timothy G. Sughrue, chief engineer of the Boston & Maine, the Maine Central and the Portland Terminal Company, has been elected executive vice-president of those roads with headquarters as before at Boston, Mass.

Mr. Sughrue was born in Nashua, N.H., on February 22, 1889, and entered railroad service in June, 1906, as a section man on the Boston & Maine during summer vacation after graduating from Nashua high school. He attended the University of New Hampshire and during summer vacations in 1906 and 1907 worked as a yard clerk and section man with the Boston & Maine. In 1909, after graduation, he was appointed chainman, becoming a rodman in 1910, a draftsman in 1911, assistant supervisor of bridges and buildings in 1914 and supervisor of bridges and buildings in 1918. Mr. Sughrue was appointed division engineer of the Terminal division of the Boston & Maine in 1927 and in 1939 he was

Timothy G. Sughrue

appointed engineer of maintenance of way of the Maine Central and Portland Terminal. He became chief engineer of these roads and the Boston & Maine on April 15, 1942.

Engineering

W. H. B. Bevan, district engineer on the Canadian National at North Bay, Ont., retired recently after 30 years service.

Bruce W. Nyland, levelman on the Delaware & Hudson, has been promoted to assistant engineer, with headquarters as before at Albany, N.Y., replacing **Lewis H. Rose,** whose appointment as track supervisor is noted elsewhere in these columns.

Edwin A. Matmey has been appointed division engineer on the Oklahoma division of the Chicago, Rock Island & Pacific, with headquarters at El Reno, Okla., succeeding **R. B. Fetters,** whose appointment as assistant superintendent is noted elsewhere in these columns.

Joseph W. Hale, who has been furloughed for military service since June, 1942, has returned to railway service and has been appointed assistant to the chief engineer of the Atlantic Coast Line, with headquarters at Wilmington, N.C. Prior to entering the army, Mr. Hale was roadmaster on the A.C.L. at Dillon, S.C. He has been hospitalized since the close of the war.

M. V. Kane, assistant engineer of clearance of the New York, New Haven & Hartford, has been promoted to engineer of clearance, with headquarters as before at New Haven, Conn., succeeding **W. P. MacKenzie,** who has retired. **O. R. Lindgren,** general bridge and building foreman at Hartford, has been promoted to assistant engineer of clearance at New Haven, replacing Mr. Kane.

J. E. Krome, assistant to the division engineer of the North Florida division of the Seaboard Air Line, with headquarters at Tampa, Fla., has been promoted to assistant division engineer of the Virginia division, at Raleigh, N.C. Mr. Krome was born in Homestead, Fla., on November 6, 1919. He attended Princeton university, graduating in civil engineering in 1947 and entered the service of the Seaboard at Tampa on September 16, 1947.

A. W. Schroeder, assistant to engineer of track of the Chicago, Burlington & Quincy, with headquarters at Chicago, has been appointed chief engineer of the Chicago & Eastern Illinois, effective March 1, with headquarters at Danville, Ill., succeeding **J. S. McBride,** who becomes chief engineer consultant, with headquarters as before at Chicago. **I. A. Moore,** division engineer of the C. & E. I. at Danville, has been promoted to assistant chief engineer, with the same headquarters, and **J. E. Bernhardt,** bridge engineer, at Chicago, has had his title changed to engineer of structures, in charge of both bridges and buildings, with new headquarters at Danville.

H. J. Fast, recently appointed district engineer of the Northern Ontario district of the Canadian National, with headquarters at North Bay, Ont., as noted in the December issue, was born in Russia and entered the service of the C.N.R. as an instrumentman at St. Thomas, Ont., in 1941. The following year he became assistant engineer at that point, and was advanced to assistant division engineer at London, Ont., in 1946. Later that year he became division engineer at Hornepayne, Ont., being transferred to the Levis division, at Levis, Que., in 1948.

(*Please turn to page* 310)

"I Told My Predecessor—(Purchasing Agent)"—
"I Don't Know a Thing About Weed Killer"

'HIS ANSWER WAS—'NEITHER DID I—JUST LET THE READE COMPANY GUIDE YOU AND YOU CAN'T GO WRONG.'

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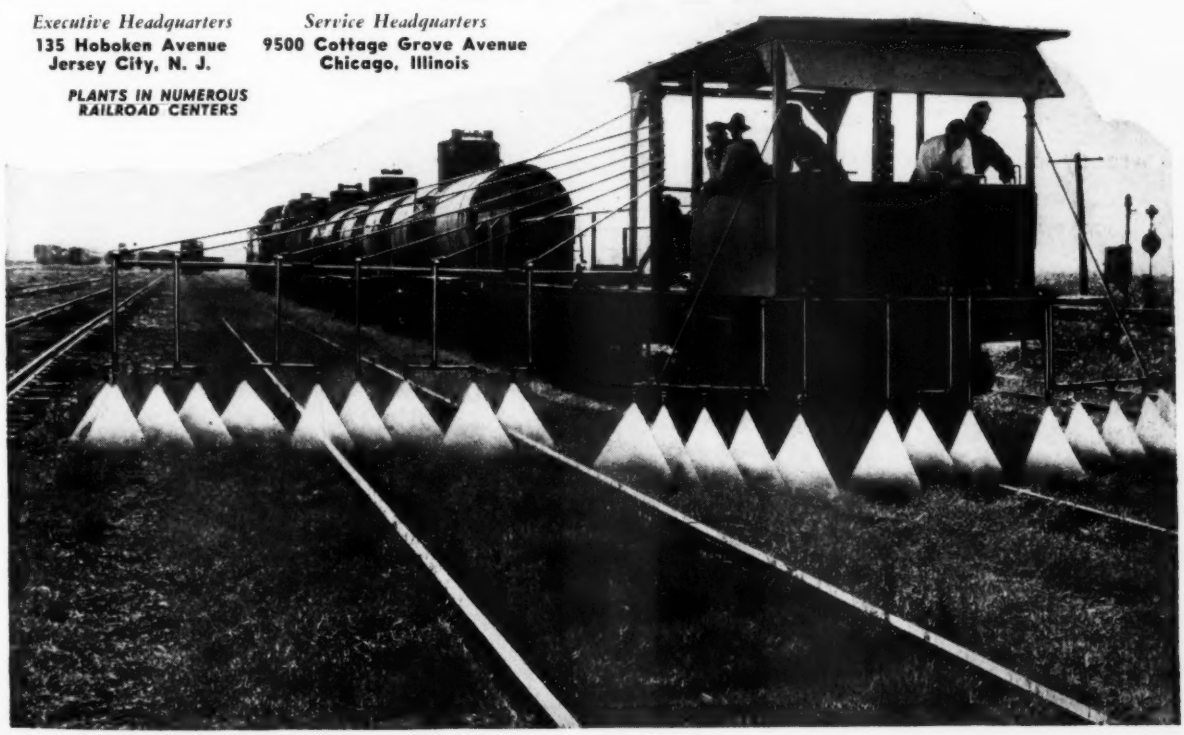

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Railway Personnel (Cont'd)

William C. E. Robinson, whose promotion to district engineer of the Ontario district of the Canadian Pacific, with headquarters in Toronto, Ont., was announced in the December issue, was born at Coldwater, Ont., on November 12, 1891. Upon completion of his education in 1908, he taught school for two years and then was employed by a contracting firm as chainman and rodman until May 1, 1912, when he became a rodman in the construction department of the Canadian Pacific, later serving as instrumentman. From 1915 until 1919, Mr. Robinson served overseas as a lieutenant in the Royal Artillery and was wounded five times. On returning to the C.P.R., he was again assigned to construction work and served as transitman, assistant engineer and resident engineer at various locations until 1928 when he became division engineer of the Bruce division, at Toronto. He later served as division engineer on the Trenton, Laurentian and London divisions and was also assigned, briefly, as industrial engineer at Montreal, Que. In 1943, Mr. Robinson was promoted to assistant district engineer of the Ontario district, with headquarters at Toronto and was holding this position at the time of his recent promotion.

William C. E. Robinson

J. E. Chubb, assistant division engineer of the Maryland division, of the Pennsylvania, with headquarters at Baltimore, Md., has been promoted to division engineer of the Toledo division, with headquarters at Toledo, Ohio, to succeed **S. M. Rodgers,** who has been transferred to the Williamsport division, at Williamsport, Pa., replacing **J. F. Piper, Jr.,** who, in turn, succeeds **K. A. Werden,** as division engineer of the Middle division at Altoona, Pa. Mr. Werden has been transferred to the Philadelphia division, at Harrisburg, Pa., to succeed **F. P. Filippelli,** whose promotion to engineer maintenance of way, at Harrisburg, was announced in the February issue. **H. W. Manning,** supervisor of track on the Panhandle division, with headquarters at Dennison, Ohio, has been promoted to assistant division engineer at Baltimore.

W. R. Garner, who was recently promoted to assistant division engineer of the Philadelphia division of the Pennsylvania, with headquarters at Harrisburg, Pa., as noted in the December issue, was born at Spokane, Wash., on December 10, 1911, and was graduated in civil engineering from Ohio State University in 1935. He entered railway service in May, 1928, serving as a trackman on the Ft. Wayne division of the Pennsylvania that summer and the following summer. After graduation in September, 1935, he returned to the Pennsylvania as an engineer apprentice on the Maryland division at Perryville, Md., and in March, 1936, was transferred to the office of the chief engineer maintenance of way, at Philadelphia, Pa. Mr. Garner was promoted to assistant on the engineering corps at Hollidaysburg, Pa., in June, 1936, and served in that capacity and as assistant supervisor of track at various points until February, 1941, when he was promoted to supervisor of track at Cincinnati, Ohio, being transferred to Terre-Haute, Ind., in March, 1942, and to Harrisburg in December, 1944, where he was located at the time of his recent promotion.

Berry M. Stephens, whose appointment as assistant to chief engineer of the Texas & New Orleans (part of the Southern Pacific Lines), at Houston, Tex., was reported in the January issue, was born at Dallas, Tex., on June 2, 1904, and received his higher education at Texas Agricultural & Mechanical college. He entered the service of the T.&N.O. in October, 1926, as a draftsman in the chief engineer's office at Houston, and in May, 1929, he became an estimator-draftsman on the Dallas division, with headquarters at Ennis, Tex. From December, 1929, to October, 1935, he served successively as office

Berry M. Stephens

engineer, estimator-draftsman, rodman and draftsman at Ennis. Mr. Stephens was later transferred to Houston as draftsman in the chief engineer's office, and in March, 1939, he was advanced to chief draftsman at that point. He was promoted to architectural engineer at Houston in July, 1945, and was holding this position at the time of his recent appointment as assistant to chief engineer.

(Please turn to page 312)

NEW! ALUMINUM ALLOY TRACK JACK

41½ LBS. *LIGHT!*

Simplex-Engineered

FOR 15 TONS OF POWER

A track jack that's really new! That's the Simplex A17. Made of aluminum alloy for easy portability, yet *engineered* to provide the strength and power of heavier malleable jacks through 40% extra support at stress points. The toe lifting area has been *increased more than 100%* (2½" x 3¼") to permit jacking under ends of ties without damage.

Shorter fulcrum center for easier lifting; new socket and lifting pawl construction to reduce parts replacement. Safety thumbguard protects operator when tripping jack. Lifts full 15 ton capacity on cap or toe; overall height 22¾" with 13" lift. Get complete details in new Bulletin Track 49.

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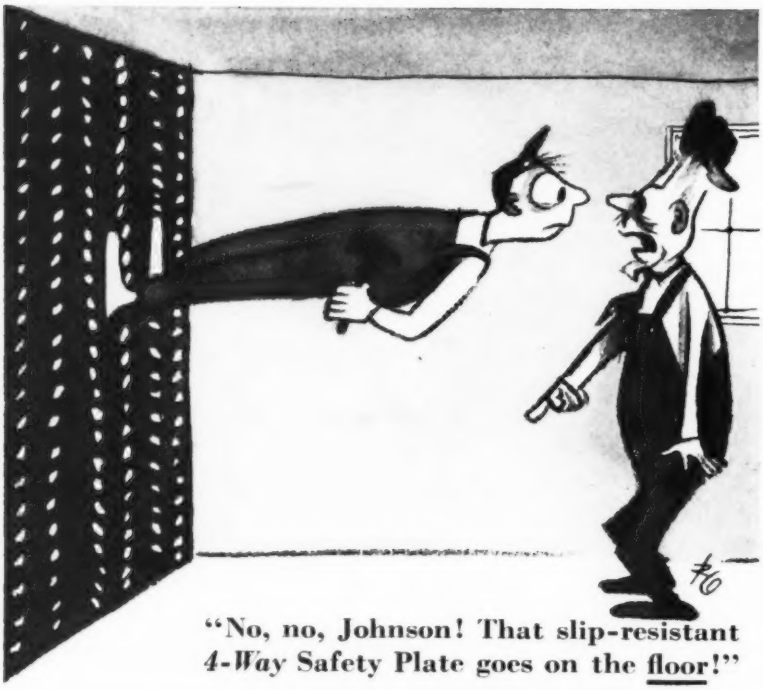

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Railway Personnel (Cont'd)

L. E. Donovan, track supervisor on the Illinois Central at Springfield, Ill., has been promoted to division engineer, with headquarters at Clinton, Ill., succeeding **S. C. Jump,** who has retired, effective March 1, after 46 years of service.

Col. A. L. Bartlett, assistant to the chief engineer of the New York, New Haven & Hartford, with headquarters at New Haven, Conn., retired on January 31 after 37 years' service with that road. **L. W. Short,** cost engineer, with headquarters in New Haven, has also retired.

Frederick H. Lovell, assistant engineer of bridges and buildings of the Central region of the Pennsylvania, has been promoted to engineer of bridges and buildings, with headquarters as before at Pittsburgh, Pa., succeeding **J. F. Leonard,** who has been granted a leave of absence pending his retirement on July 1.

Stanley G. Phillips, engineer maintenance of way of the Maine Central, and the Portland Terminal Company, with headquarters at Portland, Me., has been promoted to chief engineer of the Boston & Maine, the Maine Central and the Portland Terminal Company, with headquarters at Boston, Mass., succeeding **Timothy G. Sughrue,** whose election as executive vice-president of these roads is announced elsewhere in these columns. **James W. Wiggins,** assistant to the chief engineer of the Boston & Maine, at Boston, has been appointed engineer maintenance of way of the Maine Central and the Portland Terminal Company, with headquarters at Portland, succeeding Mr. Phillips.

Norman I. Huntley, whose appointment as assistant engineer of the Long Island, with headquarters in Jamaica, N.Y., was announced in the December issue, was born at Philadelphia, Pa., on December 26, 1905, and graduated from Pennsylvania State College in 1928 with the degree of Bachelor of Science in Civil Engineering. He entered the service of the Long Island on February 11, 1929, as an assistant on the engineering corps at Jamaica and subsequently was employed as draftsman, welding foreman, and inspector on grade-crossing elimination work until March, 1942, when he was assigned to special work incident to the construction of Camp Kilmer, Stelton, N.J. On July 1, 1942, Mr. Huntley was appointed assistant master carpenter of the New York division of the Pennsylvania, with headquarters at Jersey City, N.J. He was promoted to master carpenter of the St. Louis division, at Terre Haute, Ind., on July 1, 1945, and held that position until his recent appointment.

(*Please turn to page* 314)

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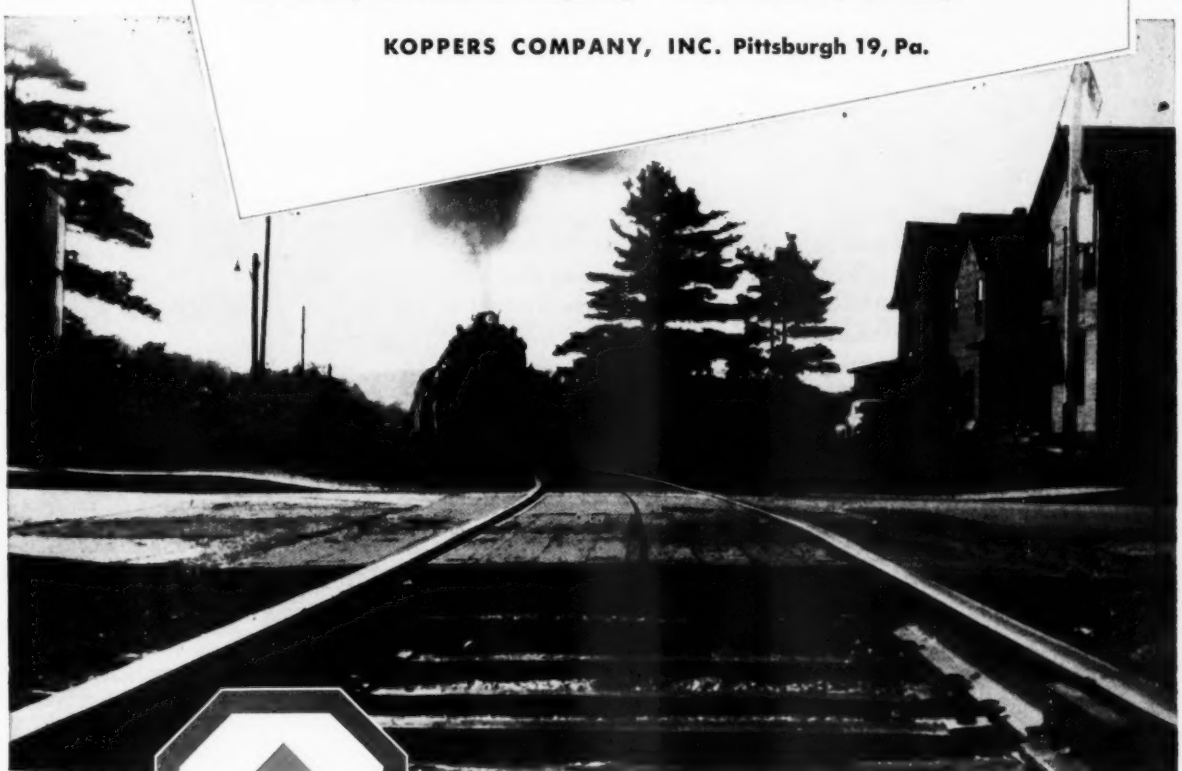

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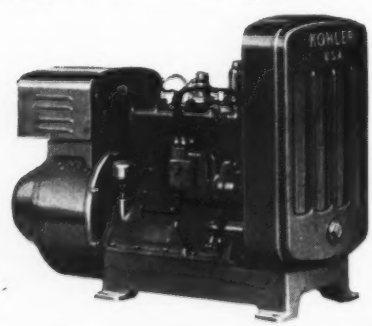

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Railway Personnel (Cont'd)

O. Tucker, section foreman on the Chicago Heights Terminal Transfer, at Chicago Heights, Ill., has been appointed assistant track supervisor on the Chicago & Eastern Illinois at Evansville, Ind.

Rodney E. Dennis, whose promotion to roadmaster on the Canadian National, with headquarters at Brandon, Man., was announced in the January issue, was born on October 16, 1916, at Swan River, Man. He entered the service of the C.N.R. as a sectionman at Winnipeg, Man., in 1934, being promoted to assistant section foreman in 1937 and to foreman in 1941. Since that date he has served, also, as extra-gang foreman and relief roadmaster at various locations. His appointment as roadmaster was effective September 1, 1948.

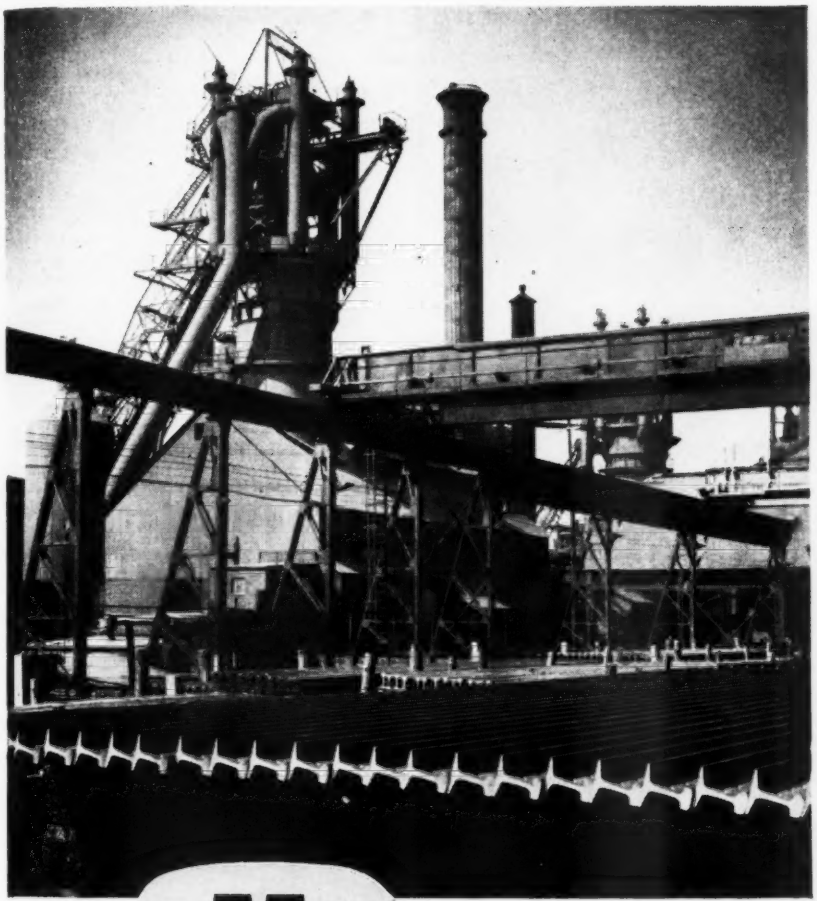
Alex Salerno, assistant roadmaster of the Chicago & Western Indiana, has been promoted to roadmaster, with headquarters as before at Chicago, succeeding **P. F. Muller,** who has retired.

Lewis H. Rose, assistant engineer on the Delaware & Hudson, with headquarters at Albany, N.Y., has been appointed track supervisor at Whitehall, N.Y., replacing **John F. Rourke,** who has retired because of ill health.

W. C. McCormick, roadmaster on the Carolina division of the Seaboard Air Line, has been promoted to general roadmaster, with headquarters as before at Savannah, Ga. **L. G. Sharpe,** assistant roadmaster on the Virginia division, with headquarters at Henderson, N.C., has been promoted to roadmaster on the Georgia division, at Hamlet, N.C., where he replaces **W. A. Thompson,** who has been transferred to the Carolina division, at Savannah, to succeed Mr. McCormick. **H. C. Alford,** assistant roadmaster on the system rail gang, has been transferred to Henderson to succeed Mr. Sharpe.

William Glavin, assistant supervisor of track on the Maryland division of the Pennsylvania, with headquarters at Perryville, Md., has been promoted to supervisor of track on the Grand Rapids division, at Kalamazoo, Mich., where he succeeds **R. E. Gorsuch,** who has been transferred to the Williamsport division at Northumberland, Pa., replacing **W. K. Mangum.** Mr. Mangum has been moved to the Philadelphia Terminal division, with headquarters at Philadelphia, Pa., succeeding **Norman Olsen,** who, in turn, has been transferred to the Panhandle division, at Dennison, Ohio, to replace **H. W. Manning,** whose promotion to assistant division engineer is noted elsewhere in these columns. **C. R. Armentrout,** junior engineer on the Maryland division, has been promoted to branch-line assistant supervisor on the Philadelphia division, with headquarters at Enola, Pa., where he succeeds **Melvin Brown** who has been transferred to the main line of the Maryland division, at Perryville, succeeding Mr. Glavin.

(Please turn to page 316)



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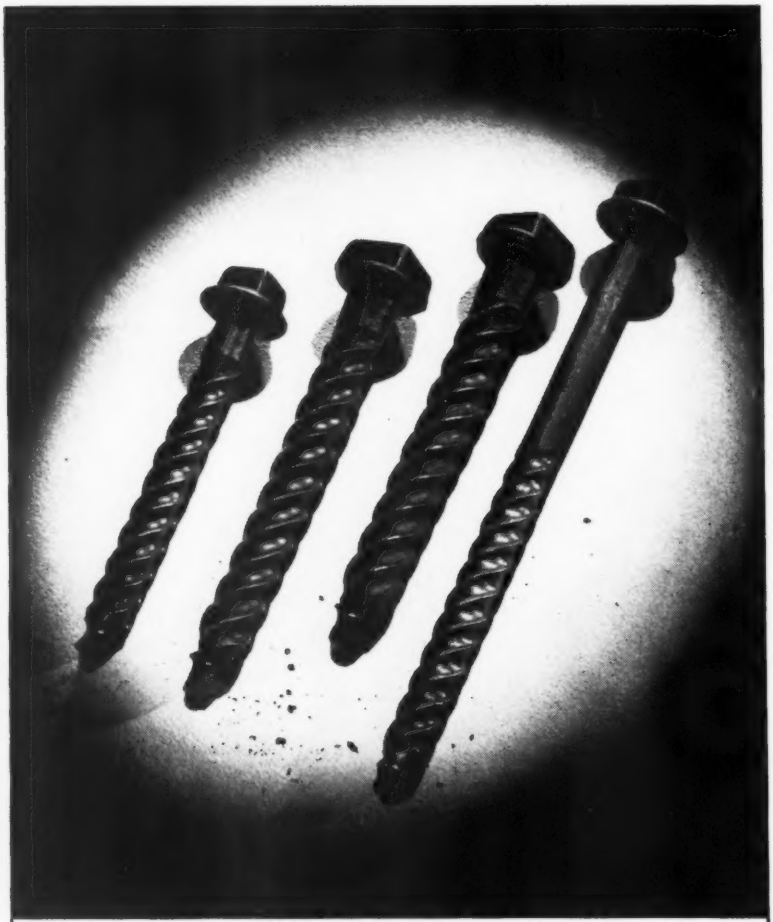

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Railway Personnel (Cont'd)

S. D. Burton, extra gang foreman on the St. Louis division of the Illinois Central, has been promoted to track supervisor at Bluford, Ill., succeeding **C. A. Hagen,** who has been transferred to La Salle, Ill., to replace **C. E. Brooks.** Mr. Brooks has been appointed track supervisor at Clinton, Ill., succeeding **P. A. Cosgrove** who has been transferred to Springfield, Ill., where he replaces **L. E. Donovan,** whose promotion to division engineer is reported elsewhere in these columns.

F. W. Holland, general foreman on the Marion division of the Erie, with headquarters at Hammond, Ind., has been promoted to crossing supervisor on the Mahoning division, with headquarters at Youngstown, Ohio, succeeding **P. J. Davidson,** who retired recently. **James K. Weikal,** general foreman on the Susquehanna division, at Hornell, N.Y., has been promoted to track supervisor on the New York division, with headquarters at Campbell Hall, N.Y., succeeding **G. D. Stoddart,** who has been transferred to Binghamton, N.Y., where he replaces **W. E. McGuire,** who retired December 31, account of ill health.

W. C. McCormick, roadmaster of the Carolina division of the Seaboard Air Line, has been promoted to general roadmaster, with jurisdiction north and west of Savannah, Ga., with headquarters as before at Savannah.

Bridge and Building

W. Hirst, bridge and building master on the Canadian Pacific, with headquarters at Winnipeg, Man., retired recently after 42 years service.

Obituary

Daniel T. Mack, architect of the Delaware, Lackawanna & Western, at Hoboken, N.J., died suddenly on January 17.

F. C. Knight, valuation engineer on the Canadian National, with headquarters at Toronto, Ont., died recently. He was 62 years of age.

C. U. Stout, retired assistant engineer on the Canadian National, died recently at Edmonton, Alta., at the age of 64.

H. N. Huntsman, chief engineer of the Litchfield & Madison at Edwardsville, Ill., died on February 8 at Barnes Hospital in St. Louis, Mo., after a lingering illness. He first entered railroad service with the Chicago, Burlington & Quincy in the engineering corps and about three years later joined the Wabash as a division engineer. He served in the latter post for about 14 years and was also associated later with a private contracting firm for a number of years. Mr. Huntsman was in business for himself for six years prior to joining the L.&M. on April 1, 1943.

(Please turn to page 318)

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Association News

American Railway Engineering Association

As indicated on pages 272 and 273 of the feature section of this issue, plans have been completed for the annual meeting of the association that is scheduled to be held at the Palmer House, Chicago, March 15-17. All bulletins containing committee reports are now in the hands of the members and the Yearbook, this year containing many special features related to the Golden Anniversary celebration of the association, will be in the hands of members before they leave for the convention.

National Railway Appliances Association

The annual exhibit of the association is being held at the Coliseum, Chicago, March 14-17, coincident with the Golden Anniversary meeting of the American Railway Engineering Association. On pages 274, 275 and 276 of the feature section of this issue appears a complete list of the exhibitors, including the products to be displayed and the booth num-

(*Continued on page 320*)

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting, September 12-14, 1949, Hotel Stevens, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 15-17, 1949, Chicago. W. S. Lacher, secretary, 59 E. Van Buren street, Chicago 5.

American Wood-Preservers' Association—Annual Convention April 26-28, 1949, St. Louis, Mo. H. L. Dawson, secretary-treasurer, 1429 Eye street, N.W., Washington 5, D.C.

Bridge and Building Supply Men's Association—E. C. Gunther, secretary, 122 S. Michigan avenue, Chicago 3.

Maintenance of Way Club of Chicago—Next meeting, March 28, 1949. E. C. Patterson, secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—John S. Vreeland, secretary, 30 Church street, New York.

National Railway Appliance Association—Annual exhibit, Chicago, March 14-17, 1949 in connection with the A.R.E.A. convention. R. B. Fishet, secretary, 1 No. LaSalle street, Chicago 4.

Railway Tie Association—Annual convention, September 12-14, 1949, Peabody Hotel, Memphis, Tenn. Roy M. Edmonds, secretary-treasurer, 610 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual meeting, September 12-14, 1949, Hotel Stevens, Chicago. Elise LaChance, secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, secretary, 59 E. Van Buren street, Chicago 5.

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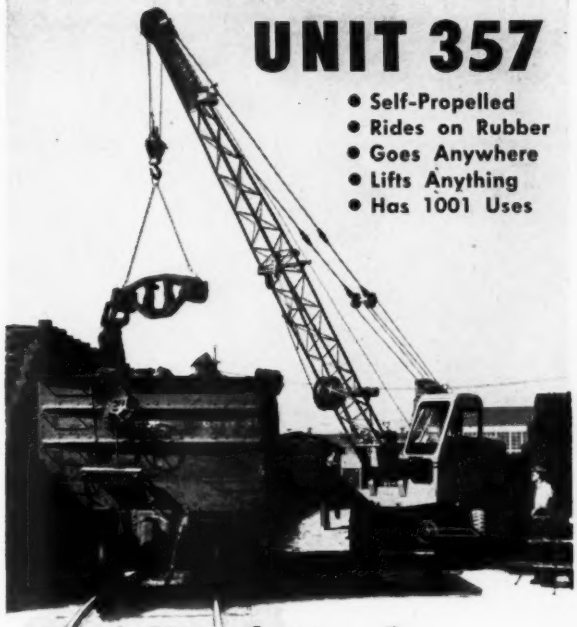

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UNIT 357 handles easily...Works efficiently in close quarters.

The ideal machine for right-of-way maintenance . . . railroad shops . . . or stores departments. Ready for action with a push of the starter. Cuts maintenance costs to rock bottom. Fully convertible. Gas or Diesel power. Ask for literature.

Operated by ONE man . . . Powered by ONE engine . . . Controlled from ONE position in UNIT's safety-promoting FULL VISION CAB.

UNIT CRANE AND SHOVEL CORP.

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SHOVELS • DRAGLINES • CLAMSHELLS
CRANES • TRENCHOES • MAGNETS

Get these *Three-way Savings* with CONTROLLED BALLAST SPREADING

THE Automatic Ballast Spreader, successfully used by leading railroads for 20 years, will save you up to 50 man-hours per car of ballast! How? Because: (1) *It largely eliminates hand distribution.* Flow of ballast is regulated as the car moves along, according to the quantity needed at various points. Ballast is deposited between or outside rails, between tracks, on shoulders, or at all points mentioned. (2) *Ballast goes further because waste is eliminated.* (3) *No special ballast cars needed.* The Automatic Ballast Spreader attaches in minutes to any self-cleaning hopper car.

The Automatic Ballast Spreader ties up no investment in equipment; you pay only when you use it. Makes money for the road because it saves more than it costs. Get all the details today.

"CONTROLLED BALLAST SPREADING"

SCIENTIFIC PRODUCTION CORPORATION
3852 Grand Central Terminal
NEW YORK 17, N.Y.

Association News (Cont'd)

bers, along with a floor plan of the exhibit hall.

The exhibit will open on Monday, March 14 (a day ahead of the convening of the A.R.E.A. Convention) and will extend through Thursday. The doors will open each day at 9:00 a.m. and close at 6:00 p.m., except that on Thursday the exhibit will close at 3:00 p.m. Being located in the Coliseum on South Wabash avenue, the exhibit will be only a few minutes ride from the Palmer House by street cars, which may be boarded practically at the door of the hotel.

Wood-Preservers' Association

Plans are rapidly being completed for the Forty-Fifth Annual Meeting of the association, to be held at the Hotel Jefferson, St. Louis, Mo., April 26-28. A tentative program and schedule of events has been mailed to members, which indicates another outstanding convention, with many technical reports and addresses of specific interest to railway men.

No special trains or Pullman accommodations were being arranged this year, and those planning to attend the convention are asked to make their own reservations.

Metropolitan Maintenance of Way Club

L. L. Adams, assistant chief engineer of the Louisville & Nashville, Louisville, Ky., was the principal speaker at the last meeting of the club which was held in the Skyline room of the Hotel Sheraton, New York, on February 24. Mr. Adams described the hurricane damage suffered by the L. & N. in September, 1947, when a 37-mi. stretch of track was almost entirely destroyed, and told of some of the measures that were taken to restore the affected line to service.

Th election of officers for the year 1949-50 will be held at the next meeting, which will be held at the Hotel Sheraton on April 28.

Roadmasters' Association

For the convenience of its members who will attend the A.R.E.A. and N.R.A.A. activities in Chicago during the week of March 14, President R. L. Fox has called a meeting of the Executive committee, to be held at the Chicago Engineers' Club, Chicago, beginning at 9:00 a.m., on March 14. While routine association matters are the major items on the agenda, the committee will review the status of current technical committee work, lay preliminary plans for the fall convention of the association, September 12-14, and adopt measures to further its current drive for new members.

Application blanks for membership in the association can be secured from A. G. Reese, district maintenance engineer of the Burlington, at Galesburg, Ill., who is chairman of the association's Membership committee, or from the secretary of the association, Elise LaChance, 431 S. Dearborn street, Chicago.

(*Please turn to page 322*)

for the "Dog-gone-dest"

TOUGHEST HOLE-DIGGING JOBS

KA-MO

BORING MACHINES

can handle 'em

Here's one, for example: The job illustrated was drilling for piling and casing, in a "tricky" spot. A KA-MO Boring Machine was suspended from a crane boom and handled the job to perfection.

Does New, Difficult Jobs, Every Day

No wonder users of the KA-MO Boring Machine say, *"It's a humdinger of a hole-digger!"* It will dig holes from 3" to 24"—vertical, horizontal or at any angle, and in lengths to meet your needs. Motors from 3 to 15 H. P.

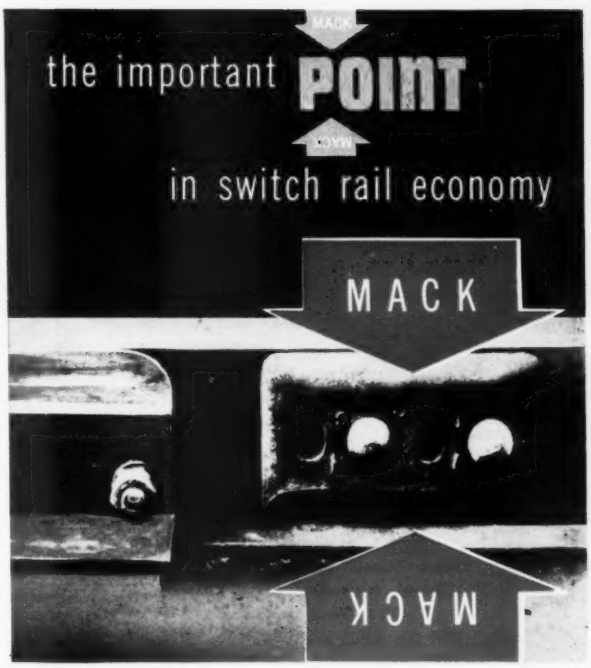
You can use KA-MO for drilling into the side of banks for drainage or for testing roadbeds . . . drilling for telephone and powerline poles . . . drilling under roadbeds for cable . . . or through casing under railroad beds, pulling casing as drill goes forward (up to 30" casing) . . . drilling for piling or concrete piers, etc.

CONSULT US *on your hole-boring problems. Write us for detailed literature.*

3212

KA-MO TOOLS, INC.
2121 S. Troy Street • Chicago 23, Illinois

the important **POINT** in switch rail economy



MACK reversible switch POINT protector

- As originally applied, MACK lengthens Switch Rail Life 4 or 5 Times.
- When MACK wears down, reverse it and it lengthens Switch Rail Life 4 or 5 Times More!

So, your Switch Rail Life is actually lengthened 8 to 10 times!

. . . that's the **POINT**

Visit Us at Booths 66 and 67 N. R. A. A. EXHIBITION
Coliseum • Chicago • March 14 to 17 inclusive

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Maintenance Equipment Company
RAILWAY EXCHANGE BUILDING • CHICAGO, ILLINOIS

Rail-Road Specialist Only

Burro Cranes Have:

- Fast travel speeds—up to 22 M.P.H.
- Draw Bar Pull of 7500 lbs. (often eliminates need for work train or locomotive).
- Elevated Boom Heels for working over high sided gondolas.
- Short tail swing—will not foul adjoining track.
- Low overall height—Burro can be loaded and worked on a standard flat car.

We call Burro Cranes "Railroad Specialists" because they do so many railroad jobs so well. Track work, bridge work, bulk materials handling, Mechanical Stores Department, material handling with or without magnet, are only a few jobs Burro does with speed and economy.

Burro Cranes are designed for railroad work—not adapted to it. Watch a Burro work and see why it's called on to do so many jobs by most of the country's railroads.

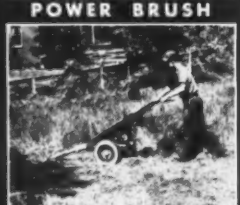
Burro WORK Power means more EARNING Power

CULLEN-FRIESTEDT CO.
1301 S. Kilbourn Ave., Chicago 23, Ill.

Cut the cost of RIGHT-OF-WAY and STATION MAINTENANCE with GRAVELY *POWER* EQUIPMENT!

48" SNOWPLOW

POWER BRUSH


MOWER

SNOW REMOVAL . . . Clear docks, platforms and drives quickly with the 48" Snow Plow Attachment for the powerful 5-HP GRAVELY. One Snow Plow does the work of eight men—proved in user tests.

POWER SWEEPING . . . Keep stations, walks and drives shining with the Rotary Brush Attachment. 38" of sweeping width, replaceable brush segments, gear driven. Sweeps CLEAN the first time over.

MOWING . . . Mow right-of-ways and lawns economically with the GRAVELY mowing attachments. Rotary Mower for station lawns, Sicklemower for right-of-ways. Extension axles allow efficient work on 60 degree slopes.

SAVINGS in maintenance cost are an old story to GRAVELY users. Ask us for details about our 17 attachments. SERVICE is always available, anywhere, for the GRAVELY . . . and the GRAVELY has a REVERSE, DIRECT GEAR DRIVE, 5 HP.

GRAVELY
MOTOR PLOW & CULT. CO.
Box 342
DUNBAR, W. VA.

SEND FOR NEW FREE CATALOG

Association News (Cont'd)

Maintenance of Way Club of Chicago

The next meeting of the club will be held on March 28 in the Field Building, Clark and Adams streets, beginning with a reception at 6:00 p.m. and dinner at 6:30 p.m. The feature of the meeting will be a review by F. G. Campbell, chief engineer, E. J. & E., of the highlights of the many technical addresses and reports presented before the three-day, Golden Anniversary convention of the American Railway Engineering Association, March 15-17. This review, which will be keyed to the specific interests of members, should prove particularly valuable to those who for one reason or another may not have the opportunity to attend all of the A.R.E.A. sessions.

The February 28 meeting of the club was addressed by C. H. Paris, consulting engineer (formerly chief engineer, Chicago & Illinois Midland), who spoke on The Railway Situation in China.

Bridge and Building Association

Taking advantage of the attendance of many of the officers of the association at the A.R.E.A. convention and N.R.A.A. exhibit in Chicago during the week of March 14, President E. H. Barnhart has called a luncheon meeting of the Executive committee on Wednesday, March 16, to be held by the Chicago Engineers' Club, at 12:30 p.m. While a preliminary review will be made of the status of technical committee work now under way, attention of the committee will be focused on a continuing drive for new members and preliminary plans for the annual convention in Chicago, September 12-14.

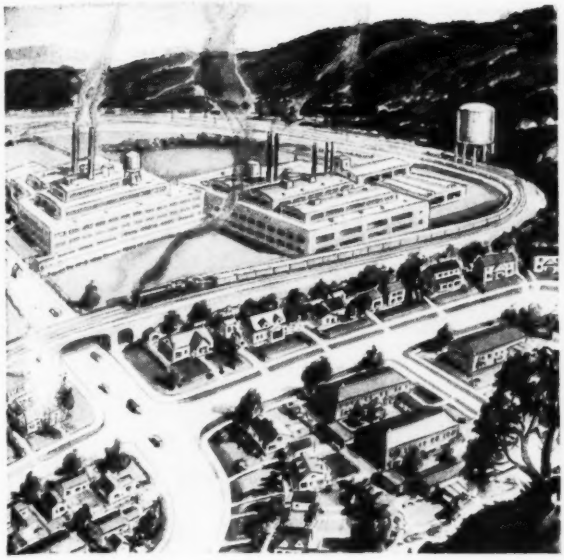
Applications for membership in the association should be made directly to W. F. Martens, general foreman of bridges and buildings, Santa Fe, at San Bernardino, Cal., chairman of the membership committee, or to the secretary of the association, Elise LaChance, 431 S. Dearborn street, Chicago.

Supply Trade News

Personal

James G. Lyne has been elected president of the **Simmons-Boardman Publishing Corporation,** publisher of *Railway Engineering and Maintenance,* Railway Age and other trade magazines in the transportation and building fields. Mr. Lyne succeeds **Samuel O. Dunn,** who was both chairman of the board and president, and who was re-elected chairman and chief executive officer. Prior to acceding to his new position Mr. Lyne was executive vice-president of the company and co-editor, with Mr. Dunn, of

(*Continued on page* 324)



LONGER SERVICE

At Lowest Cost

FACTORIES, processing plants, railroads etc., the Nation over are buying more and more Layne Well Water Systems and Layne Vertical Turbine Pumps. Here is well water producing equipment that meets every requirement for sustained high efficiency, dependable long life and welcomed economy in operation cost.

Layne well water producing equipment has always been designed and built to outlast any other made. The use of finest materials throughout, plus rugged strength and manufacturing craftsmanship practically eliminates breakdowns and costly repairs.

The production from Layne Well Water Systems is often double and sometimes triple that of conventional type wells and pumps. In some cases one Layne Well Water System produces enough water to replace several less efficient systems. The savings thus enjoyed, have made the change very profitable.

Complete installations by Layne include everything from preliminary survey, exploration, well drilling, pumps and pump installation, delivering the system ready for service, fully tested and operation. For further information, catalogs, bulletins, etc., address LAYNE & BOWLER, INC. General Offices, Memphis 8, Tenn.

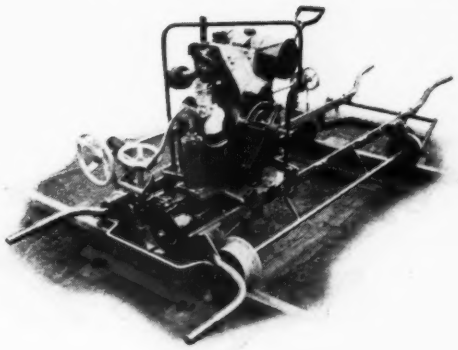
LAYNE

WELL WATER SYSTEMS

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. * Layne-Atlantic Co., Norfolk, Va. * Layne-Central Co., Memphis, Tenn. * Layne-Northern Co., Mishawaka, Ind. * Layne-Louisiana Co., Lake Charles, La. * Louisiana Well Co., Monroe, La. * Layne-New York Co., New York City * Layne-Northwest Co., Milwaukee, Wis. * Layne-Ohio Co., Columbus, Ohio. * Layne-Pacific, Inc., Seattle, Washington * Layne-Texas Co., Houston, Texas * Layne-Western Co., Kansas City, Mo. * Layne-Minnesota Co., Minneapolis, Minnesota * International Water Corporation, Pittsburgh, Pa. * International Water Supply, Ltd., London, Ontario, Canada * Layne-Hispano Americana, S. A., Mexico, D. F.

DOUBLE

Grinder Performance



AT

Single Machine Cost

Here's a combination machine that does the work of two individual grinders—slots rail joints fast, accurately and removes overflowed metal from rail ends—grinds rail surfaces—saves time, saves money.

It's RTW's Model P-38 two-purpose grinder, sturdily constructed of wear-resistant materials, yet light enough for easy handling in traffic. A 6 h.p. air-cooled gas engine provides power economically . . . V-belt transmits drive from main shaft to gears . . . gears are completely housed for protection . . . insulated track wheels prevent interference with train signals.

Check these operating features:

- Bracket aligns machine for operation and locks positively to prevent any movement while slotting.
- Hand wheels adjust cutting wheel to exact position for cut.
- Engine and grinders are ball bearing mounted on transverse carriage for easy movement from one rail to the other.
- Back tension on feed control automatically raises grinding wheel up and away from work immediately upon release of downward pressure. Thus, joints can be slotted uniformly to desired depth in one cutting operation, wheel feed for surface grinding is expedited.

Write for complete information on the P-38 two-purpose grinder, it's yours for the asking.

4750

Railway Trackwork Co.

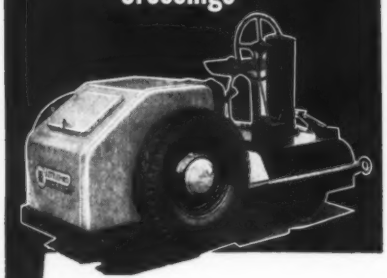
3207 KENSINGTON AVE., PHILADELPHIA 34, PA.

AGENTS FOR

Kershaw-Railway Maintenance Equipment and Mark-Rite Paint Marker

RAILWAY MAINTENANCE CREWMEN USE

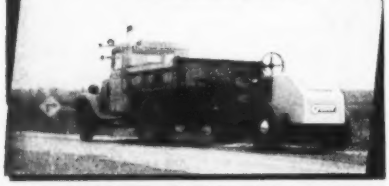
the LITTLEFORD TRAIL-O-ROLLER for Permanent Crossings



This small, compact, portable Trail-O-Roller makes blacktop crossings, parking areas, station platforms smooth permanent surfaces. The Trail-O-Roller can roll dozens of jobs in a single day—it travels as fast as the maintenance truck can go, yet it takes only 2 minutes to change it from the trailing to rolling position. And too, the compaction is as great as any 5 ton tandem roller.

If you're looking for a time and labor saving unit this Trail-O-Roller will give you the low cost way for doing permanent blacktop maintenance work. Many railroads are using the Trail-O-Roller today to save labor costs—you too can save with a Trail-O-Roller. Write for Bulletin No. 3.

Trail-O-Roller trails behind any maintenance truck.



LB LITTLEFORD

LITTLEFORD BROS., INC.
471 E. Pearl St., Cincinnati 2, Ohio

Supply Trade News (Cont'd)

Railway Age. He was also in charge of the editing of all of company's other transportation publications.

In announcing the latest change Mr. Dunn said that the "promotion of Mr.

James G. Lyne

Lyne to the presidency and other changes in the organization of the company have the obvious purpose of transferring its management as rapidly as practicable to younger and stronger hands although, after my connection with it for forty-two years, I will continue to serve it as long as I am able and in any way that my younger associates desire."

Mr. Lyne was born in St. Louis, Mo., on July 10, 1898, and spent his early years in Slater, Mo., and Herington, Kan. He was graduated from the University of Kansas with an A.B. degree in 1920, and holds a degree of doctor of philosophy from New York University (1946). Between 1914 and 1920, he worked at various times and in various minor capacities in the operating, engineering and mechanical departments of the Chicago, Rock Island & Pacific at Herington and Armourdale, Kan.; served briefly in the army during World War I, and spent some time during 1919 and 1920 as a special agent for the Bureau of Labor Statistics in Washington, D.C. Following his graduation from the University of Kansas he became, for a brief period, a reporter on the New York Daily News, and in October, 1920, joined the editorial staff of *Railway Age*. He was appointed financial editor in 1928, assistant to editor in 1938, and co-editor in October, 1947.

In addition to his editorial duties, Mr. Lyne was elected a vice-president and director of the Simmons-Boardman Publishing Corporation in 1943, assistant to chairman in November, 1946, and executive vice-president in February, 1948.

Francis W. Vigneault, Jr., has been appointed district representative for tractor equipment in the northeastern territory for the **Hyster Company.**

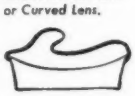
(Please turn to page 326)

Style No. 1

TWO NEW MONOGOGGLES for Show Window Vision

New, deeply cupped styles have ample room for wearing prescription glasses in comfort. The flat style provides added clearance for molded spectacle frames. Large, one-piece, plastic lens in new drop-eye shape provides wider vision. Frames are of clear acetate or flexible, mottled-brown polythene. Their lightweight and excellent impact resistance give workers all-day comfort and ample eye protection on a variety of hazardous operations.

Choice of Flat Lens or Curved Lens.



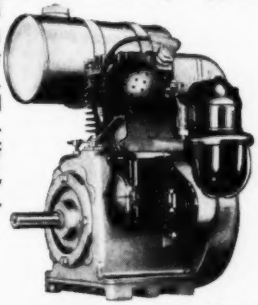
For complete information on these products and their application, as well as many more eye and respiratory protective devices, get in touch with your nearest WILLSON distributor or write us direct.

WILLSON
T.M.Reg. U.S.Pat.Off.

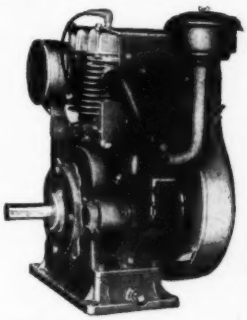
WILLSON PRODUCTS, INC., 243 WASHINGTON STREET, READING, PA.

It Takes
WISCONSIN Engine Power
as well as Men and Machines to Keep Rolling Stock Rolling

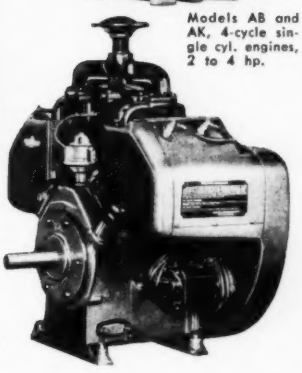
Whether the job happens to be pressure grouting the roadbed, track work with vibratory tie tampers, or shop jobs such as cleaning off old paint with pneumatic wire brushes, operating a pneumatic impact wrench, etc. . . . you will find Wisconsin Air-Cooled Engines somewhere in the background, furnishing dependable power for men and tools. Compact in design, light in weight, and extremely rugged in service, Wisconsin Air-Cooled Engines are ideal for operating a great variety of equipment within a 2 to 30 hp. power range. Trouble-free air-cooling and heavy-duty design and construction throughout are assurance of MOST H. P. HOURS OF SERVICE, with the fewest possible layups.



Models AB and AK, 4-cycle single cyl. engines, 2 to 4 hp.



Models AEH, AFH, AGH, AHH 4-cycle, single cyl., standard engines, 4 to 9 hp.



Model VE-4, V-type, 4-cyl. standard engine, 20 hp.

MOST H.P. HOURS

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 14 WISCONSIN

BEALL Hi-Duty SPRING WASHERS are made especially to stand the strain of the heavy-duty rail service required by today's high-speed freight and passenger trains.

These washers are strong and tough, yet provide the necessary "springing action" required at rail joints, frogs and crossings.

We control every step of their manufacture—from the specification of the specially-developed formula and process used in making the steel to the forming, hardening, tempering and testing operations.

BEALL TOOL DIVISION *of Hubbard & Co.*

EAST ALTON, ILL.

Specialist Manufacturers of Spring Washers

BEALL Hi-DUTY SPRING WASHERS

MADE ESPECIALLY FOR RAILROAD SERVICE

PREHY GROUTER

Routs High Cost of Roadbed Maintenance!

NEW YORK CENTRAL stabilizes roadbed swamp by PRESSURE GROUTING!

Extensive experience in pressure grouting more than 36,000 lin. ft. of track containing soft spots and water pockets led the NYC to select this method of track stabilization as the most effective for correcting the trouble. To date the treatment has been successful; the soft wet subgrade has been stabilized and maintenance costs reduced 90 per cent.

A competition for a design for national headquarters building f

See your local dealer or write for Prehy Catalog.

THE PREHY CO., INC.
420 LEXINGTON AVE., NEW YORK 17, N. Y.

Supply Trade News (Cont'd)

The **LeRoi Company,** Milwaukee, Wis., has appointed **William D. Hoffman,** 3207 Kensington avenue, Philadelphia 34, Pa., as sales agent for a group of eastern railroads.

The **Black & Decker Manufacturing Company,** Towson, Md., has announced a number of changes in its field personnel. **James F. Moore,** service engineer at Chicago, has been appointed sales engineer at that point. **T. J. Waters** succeeds him as service engineer. **R. B. McClellan** has been appointed service engineer at New Orleans, La., in place of **W. E. Boyles,** who has been transferred to Cleveland, Ohio, as sales engineer, and **Thomas Rogers** has been promoted to sales engineer at Dallas, Tex.

The district office and warehouse of the **Chain Belt Company** at Los Angeles, Cal., have been moved to larger quarters at 3838 Santa Fe avenue, with **J. V. MacDonald,** district manager, in charge. New district offices have been opened at 8001 Clayton road, St. Louis, Mo., and 340 West Church street, Jacksonville, Fla. **Clarence R. Studer,** district sales engineer, will have charge of the St. Louis office, while the Jacksonville branch will be under the direction of **David B. Hill.**

The **Syntron Company,** Homer City, Pa., has announced the opening of new sales officers at Houston, Tex., and Dallas. **W. C. Leasure** has been promoted to district sales manager at Houston, and **Nelson C. DeVilling** will act in a similar capacity at Dallas. **Dick McHale** has been appointed district sales manager at Los Angeles, Cal., and **D. E. Nugent** will have charge of power tool sales at Kansas City, Mo. **James B. Barth** replaces Mr. DeVilling at Pittsburgh, Pa., and **G. R. Stocum** succeeds Mr. McHale in the Chicago sales office.

Dr. G. V. Slottman, technical assistant to the vice-president in charge of sales of the **Air Reduction Company,** New York, has been appointed director of research and engineering. A graduate of Massachusetts Institute of Technology, Dr. Slottman received his Ph.D. degree from the University of Berlin in 1927, after which he returned to M.I.T. as a professor of chemical engineering. In 1930 he became chief combustion engineer and iron works manager for the United Steel Companies, Ltd., Sheffield, England. He joined Air Reduction in 1934 as manager of the technical sales division, serving in this capacity until January, 1948, when he was appointed technical assistant to the vice-president in charge of sales.

Harry D. Sweeney, sales engineer of the **American Manganese Steel Division** of the **American Brake Shoe Company,** has been promoted to sales manager of

Harry D. Sweeney

welding products, with headquarters at Chicago Heights, Ill. Mr. Sweeney, who has been with American Brake Shoe since 1945, is a native of Harvey, Ill., and was formerly associated with the Acme Steel Company. During World War II he served as a first lieutenant with the U.S. Army.

R. G. LeTourneau, Inc., has announced the following appointments: **S. A. Batorson,** district sales representative for northeastern United States and Eastern Canada, at Syracuse, N.Y., to assist LeTourneau distributors in New York, Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire, Maine, New Brunswick, Nova Scotia, Newfoundland and New Foundland-Labrador and Prince Edward Island; **F. W. Duke,** district sales representative to assist LeTourneau distributors in lower New York state, upper New Jersey, Pennsylvania and Maryland; **M. B. Crowley,** district sales representative, at Raleigh, N.C., to assist LeTourneau distributors in Virginia, West Virginia, and North and South Carolina; and **J. Sevick,** district sales representative in Oklahoma, Arkansas, Mississippi, Louisiana and western Tennessee. In those states Mr. Sevick will assist LeTourneau distributors, the Kessler-Simon Machinery Company, the Tri-State Equipment Company, and the Watkins-Aldridge Equipment Company.

William I. Ong, public relations director of **American Steel & Wire Co.,** a subsidiary of **United States Steel Corporation,** has been appointed assistant to the president, with headquarters at Cleveland, Ohio. **Lewis E. Zender,** assistant director of public relations, succeeds Mr. Ong, and **Alvin L. Krieg,** formerly Cleveland bureau manager for International News Service, replaces Mr. Zender.

(*Please turn to page* 328)

always ready—

- to tackle springtime maintenance work, on a few hours' notice—reshaping ballast, clearing ditches, reestablishing good drainage.
- and to whip unexpected late snows from classification yards, buck the drifted cuts, keep the traffic moving.

This year-round worker does the job of an army of men—better!

Write for the Jordan Book—100 action pictures.

O. F. JORDAN COMPANY

WALTER J. RILEY, *President*

EAST CHICAGO, INDIANA

THIS TRANSCONTINENTAL RAILROAD BOUGHT

NINETEEN BROWNINGS

IN THE LAST FOUR YEARS...OVER 100 SINCE 1906

THE new Browning M Series Locomotive Cranes are handling all types of heavy maintenance-of-way work for this class 1 railroad.

Bridge and roadway crews call for the Browning Diesels from all points on the transcontinental line—in fact it is hard to locate the Brownings from day to day.

Combining typical Browning ruggedness, long range mobility and easy operation the M Series Diesel has the versatility to handle clamshell, magnet, hookblock, piledriver and crane work on *your* job dependably and economically.

Bulletin No. 114718 describes new Browning features of design, construction and operation. Write for it today.

BROWNING LOCOMOTIVE, WAGON, TRUCK and TU-CONTROL *Cranes*

THE BROWNING CRANE & SHOVEL CO.

16224 Waterloo Road • Cleveland 10, Ohio

Supply Trade News (Cont'd)

Obituary

Walter C. Sanders, general manager of the railway division of Timken Roller Bearing Company, died in Aultman hospital, Canton, Ohio, on February 13.

James F. Seiler, an engineer with the service bureau of the American Wood Preservers' Association, with headquarters at Washington, D.C., died in that city on January 16.

Arthur J. Boase, manager of the structural and railways bureau of the Portland Cement Association, Chicago, died of a heart attack on February 9.

Trade Publications

(To obtain copies of any of the publications mentioned in these columns, use postcards, page 219)

Joint-Sealing Compound—The Flintkote Company has published a six-page, two-color folder describing its Flintseal for sealing joints in concrete. Included in the bulletin are instructions and illustrations on the preparation of the joint, and the preparation and application of the sealing compound.

Keep Floors Safe—This is the title of a four-page folder released by the Flintkote Company and dealing with Flintdeck, a synthetic plastic coating for providing non-slip walking surfaces. Printed in two colors, the pamphlet describes and illustrates the various surfaces on which Flintdeck can be used.

Industrial Steam Traps—W. H. Nicholson & Co. has issued a 12-page, illustrated bulletin which describes its thermostatic steam traps for industrial use. The catalog, identified as No. 1047, contains complete specifications concerning the various types of steam traps available, and also gives instructions for determining the proper size trap to use.

Model HM Hough Payloader—The Frank G. Hough Company has issued an eight-page illustrated booklet describing its new Payloader with a capacity of 1½ cu. yd. The bulletin contains the design features and specifications of the unit, and a number of photographs showing its application to a wide variety of work.

"Caterpillar" Diesel D2 Tractor—The Caterpillar Tractor Company has issued a 32-page booklet, printed in two colors, on this company's 32-hp. track-type tractor. Profusely illustrated, the booklet portrays the design features of the tractor and its application on a wide variety of work.

Keeping on Schedule with "Caterpillar Off-Track Equipment—This is the title of an 8-page illustrated bulletin, published by the Caterpillar Tractor Company, showing Caterpillar tractors and earth-moving equipment at work on a wide variety of construction and maintenance jobs with a minimum of interruption to rail traffic.

Wilson Doors—This is the title of a 24-page illustrated catalog listing the rolling steel doors, shutters and grilles, rolling wood doors, rolling partitions and sectionfold overhead doors manufactured by The J. G. Wilson Corporation. Also shown are construction features and space requirements for each product.

Cornell Rolling Doors—The Cornell Iron Works has released an eight-page illustrated catalogue listing the various types of rolling and sliding steel doors, fire doors, wood rolling doors and rolling and sliding metal grilles manufactured by this company. Construction details and clearance requirements are included for typical installations of each type of door.

Reynolds Extruded Aluminum Architectural Shapes—The Reynolds Metals Company has issued a portfolio of detailed drawings of this company's line of aluminum architectural shapes. The drawings, black on white, are on standard 8½-in. by 11-in. sheets, not bound together but assembled loosely in a pocket in a special binder. An index sheet is included. Also included are sheets containing in tabular form, size and weight data of aluminum rod and bar sections, and of aluminum structural sections. The company has arranged that all holders of the portfolio will be supplied with all additions and revisions that may be subsequently issued.

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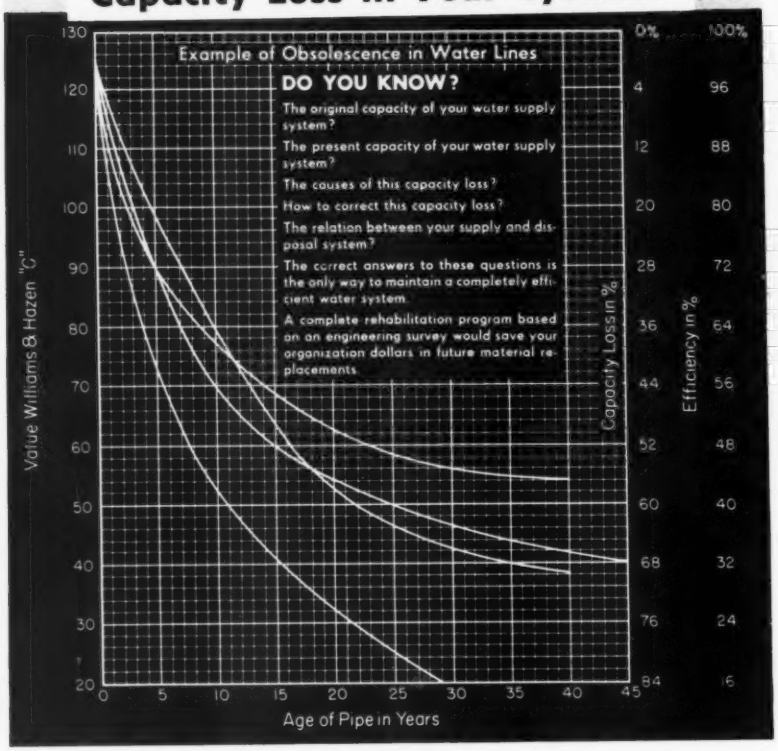
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60 40
68 32
76 24
84 16
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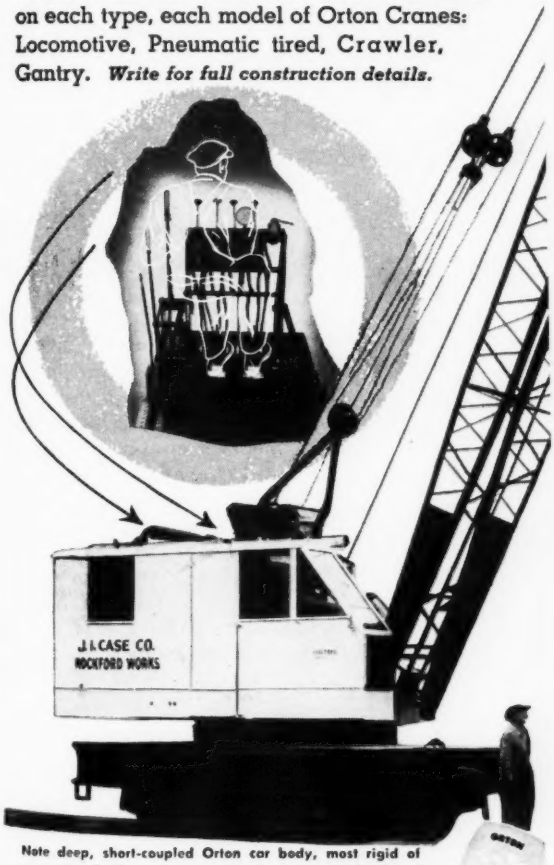

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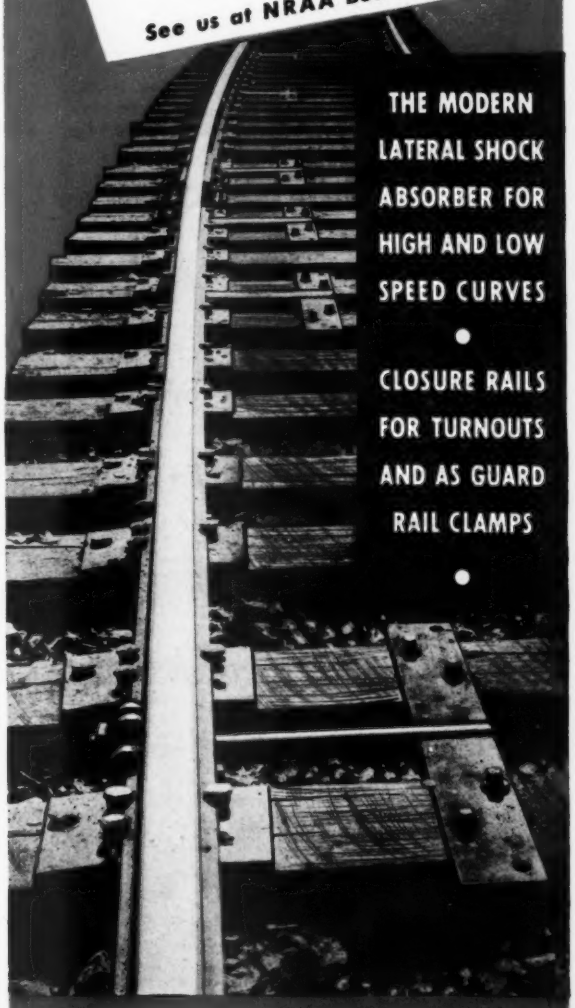

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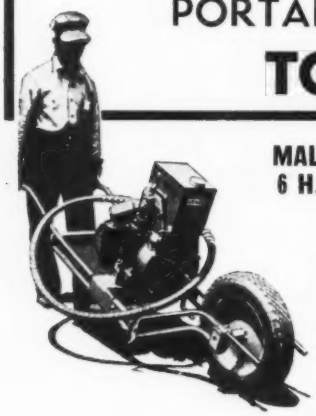

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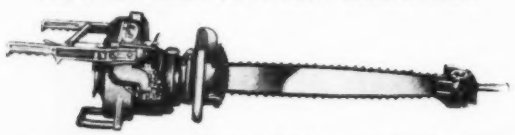

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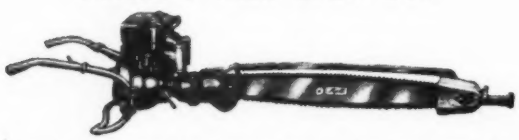

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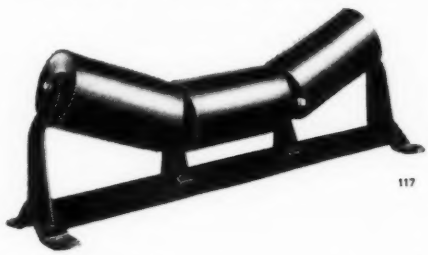

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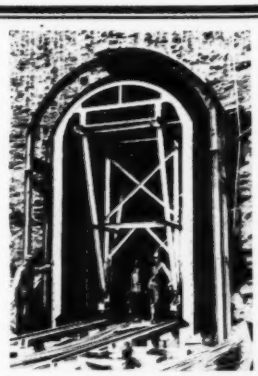

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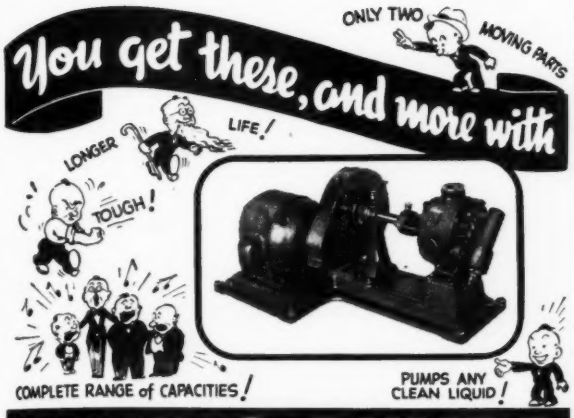

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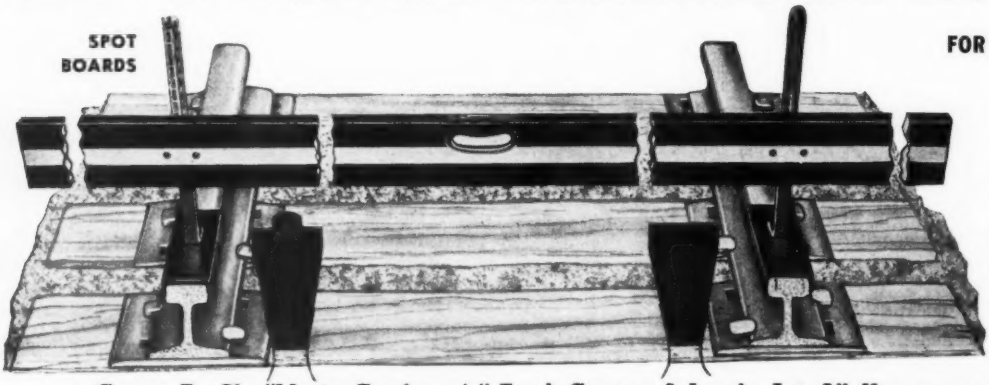

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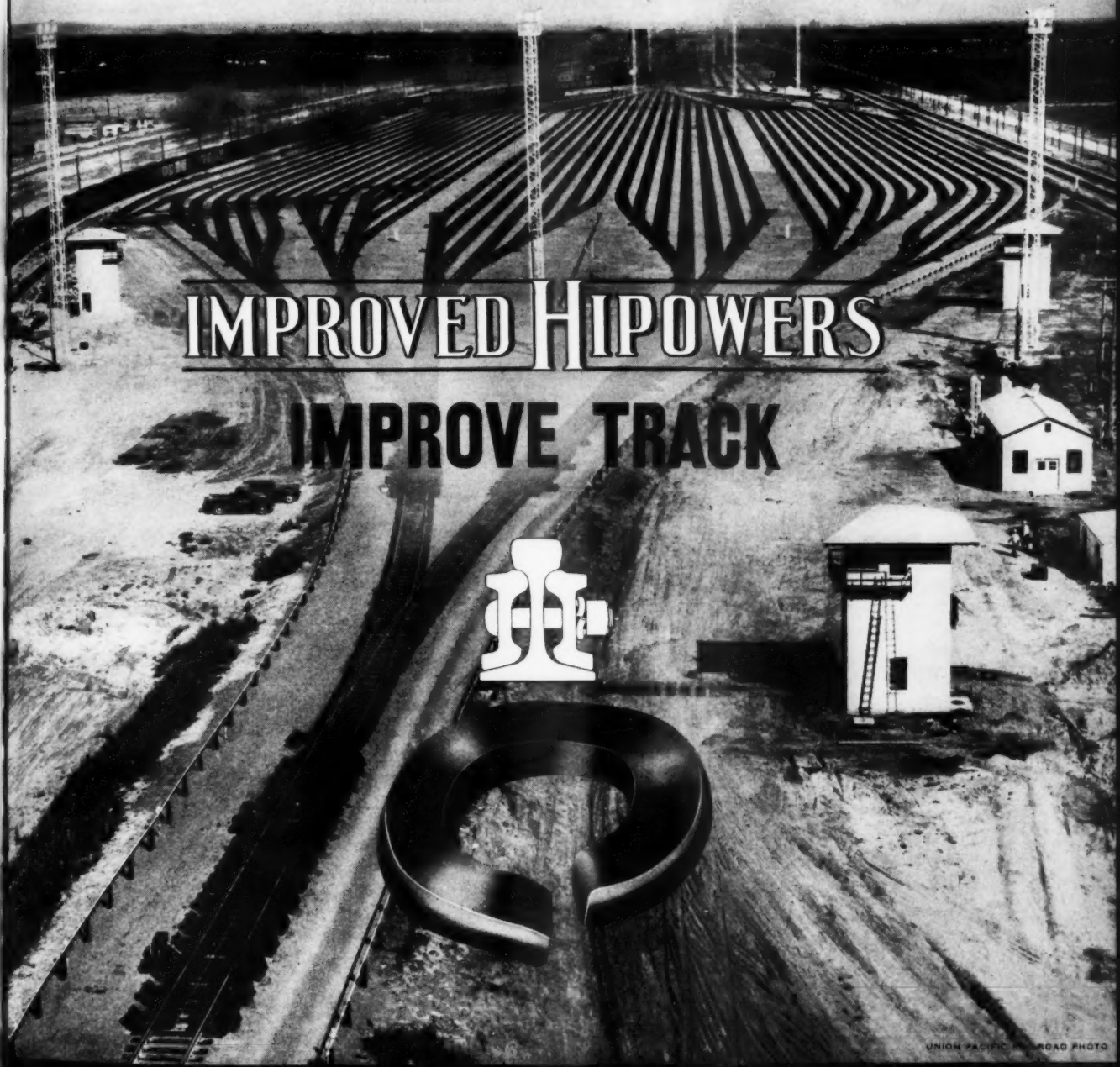

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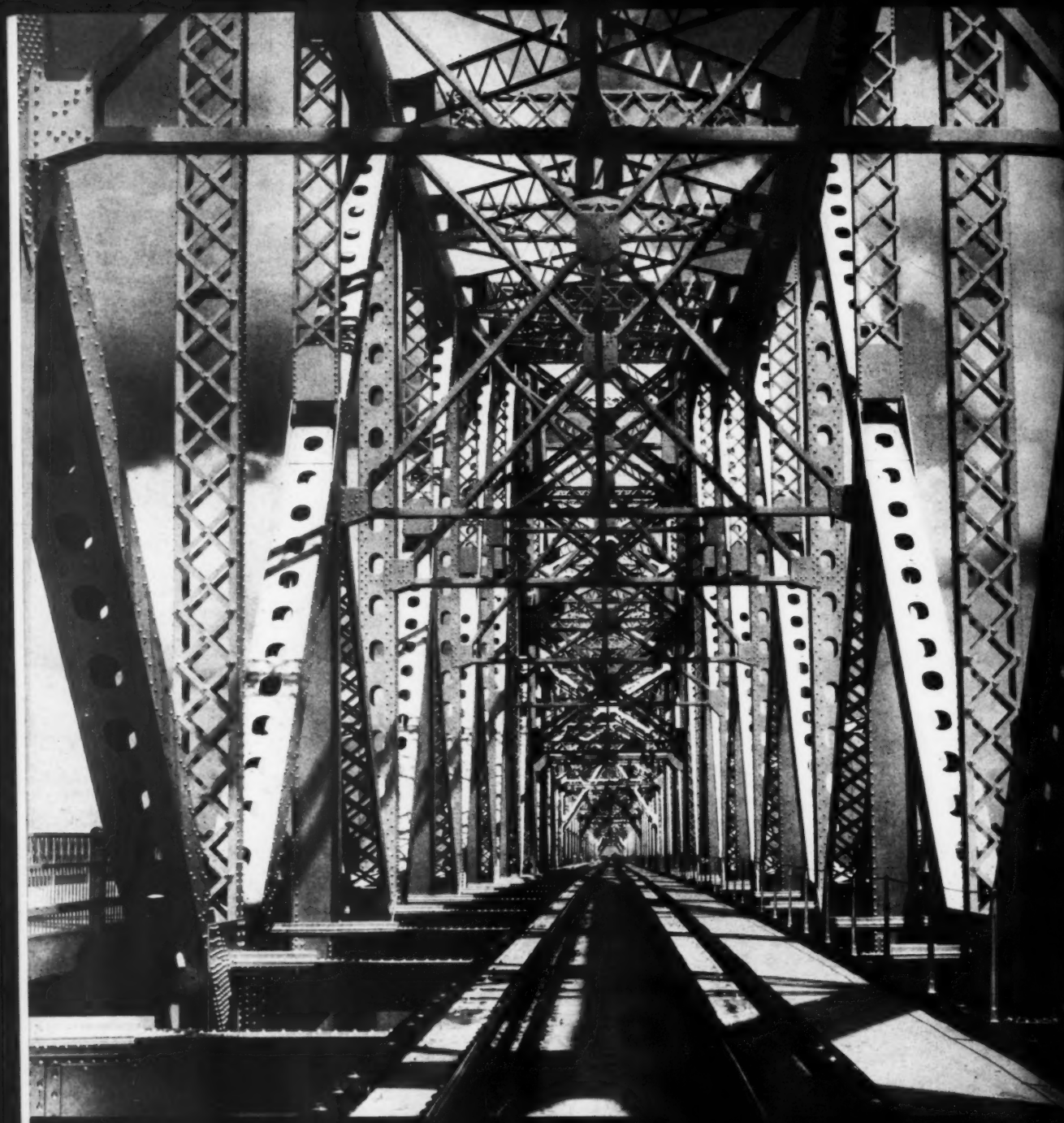

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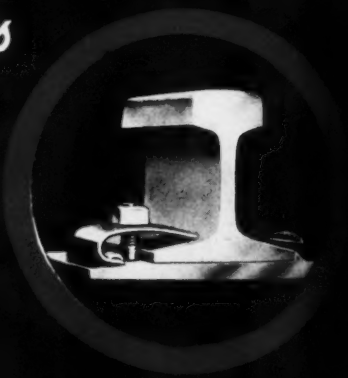

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